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CLINICAL ASPECTS OF PRIMARY ATYPICAL PNEUMONIA

A STUDY BASED ON 1,862 CASES SEEN AT STATION HOSPITAL, JEFFERSON BARRACKS, MISSOURI, FROM JUNE 1, 1942 TO AUG. 10, 1943

MAJOR ARIE C. VAN RAVENSWAAY
CAPTAIN GEORGE C. ERICKSON
CAPTAIN EDWARD P. REH
LIEUTENANT JOSEPH M. SIEKIERSKI
LIEUTENANT RUBEN R. POTTASH
AND
LIEUTENANT BERNARD GUMBINER
MEDICAL CORPS, ARMY OF THE UNITED STATES

The increasing incidence of primary atypical pneumonia in certain army hospitals in combination with its frequently prolonged febrile period and slow convalescence is rapidly making it one of the most important causes of man days lost from duty in the military service. The appearance of this disease in significant numbers of cases at the time the medical literature was heralding the conquest of pneumococcic pneumonia is but another indication that medicine will never become a static science.

Recent reports by a commission representing the Surgeon General (Dingle, Abernathy and others [1]), Dingle and Finland,[2] Reimann,[3] Seeds and Mazer,[4] Campbell and his collaborators [5] and MacLeod [6] have thoroughly reviewed the present state of knowledge regarding causation, clinical aspects, epidemiology, x-ray appearance and treatment. It has been shown that primary atypical pneumonia, as the name suggests, is a heterologous group of diverse causation. Occasional cases and groups of cases have been shown to be caused by influenza A and B viruses associated with staphylococcic and streptococcic infection, psittacosis, ornithosis and related diseases, the virus of lymphocytic choriomeningitis, the Q fever of Australia and American Q fever. In the bulk of the cases studied, however, the etiologic agent has not been determined. It seems probable that the last mentioned group has one etiologic common denominator and that ultimately it will receive a more definitive name. In the interim it is suggested that cases of atypical pneumonia due to the specific causes listed should be referred to with an appropriate specific name such as atypical pneumonia, cause psittacosis, or psittacotic pneumonia when and as diagnostic methods make this possible. The term primary atypical pneumonia should be reserved for the large group of cases of unknown causation. If the cold agglutinin test or some other comparably simple diagnostic laboratory procedure for primary atypical pneumonia, causation undetermined, is found, the differential study of the entire group of atypical pneumonias will be greatly simplified.

The present study is based on an experience with 1,862 cases of primary atypical pneumonia, causation undetermined, treated at the Station Hospital, Jefferson Barracks, Missouri, from June 1, 1942 to Aug. 10, 1943. During this interval 62 cases of lobar pneumonia of pneumococcus origin also were seen. The differential diagnosis of those two conditions was based on bacteriologic studies of the sputum, the white blood count, the x-ray appearance and the clinical course. Occasional cases occurred in which differentiation was difficult and not clearcut, but it is felt that the foregoing figures give a fair picture of the distribution of cases. The possibility that some of the group classified as primary atypical pneumonia, causation undetermined, in reality were atypical pneumonia of known causation was considered and cannot be denied for the entire group. Two hundred patients gave negative reactions to intradermal tests for coccidiomycosis. Facilities for virus studies were not available at this institution. However, owing to the epidemic character of the disease, the absence of environmental or clinical factors suggestive of the disease processes comprising the group of atypical pneumonia of known causation and the results of virus studies of similar groups of cases at other hospitals,[1] it is felt that the majority of the cases in this series were truly of "causation undetermined" and not just of causation undiscovered.

During the period from June 1, 1942 to Aug. 10, 1943 there were no deaths from primary pneumococcic pneumonia. There were 5 deaths in the group of primary atypical pneumonias. One was due to meningococcic meningitis developing in a patient convalescing from primary atypical pneumonia. In 2 cases at autopsy, consolidation was found, with a gross invasion of hemolytic Staphylococcus aureus which had not been observed on sputum cultures. It could not be established whether the bacterial invasion was the primary factor in the disease or occurred secondarily to a primary atypical pneumonia, although the evidence at hand favored the latter explanation. The mortality rate in this series of primary atypical pneumonia including these 3 cases was 0.26 per cent.

Read at the Conference of the chiefs of services of the Fourth Service Command, Atlanta, Ga., Aug. 6, 1943.

Prepared under the direction of Col. James R. McDowell, Commanding Officer, Station Hospital, and Post Surgeon, Jefferson Barracks, Missouri.

1. Dingle, John H., and others: Primary Atypical Pneumonia, Etiology Unknown, War Med. **3**: 223-248 (March) 1943.
2. Dingle, John H., and Finland, Maxwell: Virus Pneumonias: II. Primary Atypical Pneumonia, Unknown Etiology, New England J. Med. **227**: 378-386 (Sept. 3) 1942. Finland and Dingle.[1]
3. Reimann, Hobart A.: Viral Pneumonia, Bull. New York Acad. Med. **19**: 177-182 (March) 1943.
4. Seeds, Asa E., and Mazer, Martin L.: Virus Pneumonia: Roentgenographic Characterization of Recent Virus Pneumonitis Bronchopneumonia, Am. J. Roentgenol. **49**: 30-38 (Jan.) 1943.
5. Campbell, Thomas A.; Strong, P. S.; Grier, G. S., and Lutz, R. J.: Primary Atypical Pneumonia: A Report of 200 Cases at Fort Eustis, Virginia, J. A. M. A. **122**: 723-730 (July 10) 1943.
6. MacLeod, Colin M.: Primary Atypical Pneumonia, M. Clin. North America **27**: 670-686 (May) 1943.

PRIMARY ATYPICAL PNEUMONIA: COMMUNICABILITY AND PRECIPITATING FACTORS

Evidence was obtained which suggests that the susceptibility to primary atypical pneumonia varies greatly.

The majority of the soldiers in this study came to Jefferson Barracks soon after induction into the Army.

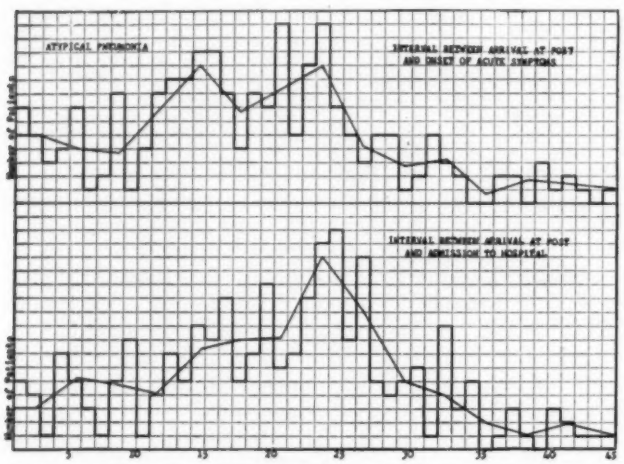
ATYPICAL PNEUMONIA
INTERVAL BETWEEN ARRIVAL AT POST AND ONSET OF ACUTE SYMPTOMS
INTERVAL BETWEEN ARRIVAL AT POST AND ADMISSION TO HOSPITAL

Chart 1.—Onset of acute symptoms and admission to hospital after arrival at post.

During the initial period of adjustment with its attendant fatigue and exposure to an unaccustomed environment the incidence was at its peak. After a period of thirty-five to forty days, however, at Jefferson Barracks a soldier's chances of developing the disease dropped to about one sixteenth of what they were on the twenty-fourth day after his arrival (chart 1). This was apparently due to an improvement in the general physical condition or the development of a specific immunity in the group of men involved. It is felt that the latter factor is the more important.

Reimann [5] and Dingle and others [7] have presented evidence indicating that the etiologic agent of primary atypical pneumonia frequently causes upper respiratory tract disease alone and that the majority of such infections occurring in association with epidemics of primary atypical pneumonia are of this type. "Colds" of varying severity occurred with great regularity in new arrivals at Jefferson Barracks during the period of this study, and if the aforementioned theory is correct it would provide an explanation of the indicated immunity.

Since primary atypical pneumonia is an infectious process presumably air borne, and since it was observed that civilian visitors to patients with this disease in the hospital not infrequently contracted it after moderate periods of exposure, it was considered important to determine the degree of isolation desirable for these patients. Attention was specifically directed to the danger of cross infection in wards to which patients with acute upper respiratory infections were sent, with which group approximately one half of the patients ultimately developing atypical pneumonia were admitted before the true character of their disease had become apparent.

Studies were made of the incidence of primary atypical pneumonia in four 55 bed upper respiratory wards during a two months period. In two wards the patients developing atypical pneumonia were allowed to remain in the wards for treatment and convalescence. In the other two wards the patients were transferred from the wards as soon as the diagnosis became evident. The number of patients present in the wards was essentially the same. In the first group of wards 58 patients developed pneumonia and in the second group this occurred in 64 instances. It should be emphasized that the majority of these cases of pneumonia were developing at the time of hospitalization, that the diagnosis was established within a short time after admission and that only in comparatively few cases did it appear to have been possibly contracted in the wards. Investigation was also made (in view of the incubation period of primary atypical pneumonia) to determine whether any of the patients in these wards not developing pneumonia did so at a later date following this period of hospitalization. It happened that no such incidents were found. It would appear that patients in these wards with upper respiratory disease alone were not endangered by prolonged exposure in the wards to patients with primary atypical pneumonia.

The theory of a common causation of primary atypical pneumonia and associated cases of upper respiratory tract infection is supported by and probably explains this apparent absence of cross infection. It is not suggested that patients with mild primary atypical pneumonia be allowed to remain intermingled with other patients and it is the policy of this hospital at the present time to transfer them to pneumonia wards for isolation in private rooms as soon as the diagnosis is made. However, in case such exposure should inadvertently occur in wards limited to respiratory tract infection the danger to other patients is apparently slight.

EPIDEMIOLOGY

In this series of cases contacts with insect, avian and animal vectors were so infrequent that they were considered of no possible epidemiologic significance. No evidence appeared to contradict the opinion of others that primary atypical pneumonia is air borne.

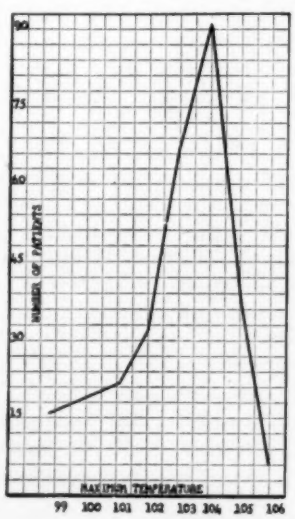

Chart 2.—Maximum temperatures observed in 290 cases.

INCUBATION PERIOD

The incubation period has been estimated to range from two to twenty-one days or longer (Reimann,[5] MacLeod [6]). From an epidemiologic standpoint the one common denominator in the cases of this series was their arrival at Jefferson Barracks from many different points throughout the United States, both civilian and military in character. In chart 1 the intervals between arrival at this post and (*a*) the development of symptoms of pneumonia and (*b*) the hospitalization of this same group for pneumonia is charted for 203 consecutive patients. It is felt that the rise beginning on the seventh day represents the initial appearance of cases developing from contacts made after arrival at the post (minimum incubation period) and that the maximum summation reached on the fifteenth day indicates roughly the maximum incubation period.

7. Finland, Maxwell, and Dingle, John H.: Virus Pneumonia: I. Pneumonias Associated with Known Nonbacterial Agents: Influenza, Psittacosis and Q Fever, New England J. Med. **227**: 342-350 (Aug. 27) 1942.

SYMPTOMATOLOGY AND PHYSICAL FINDINGS

In 297 consecutive cases of primary atypical pneumonia in which the symptoms and physical findings were carefully observed and recorded for statistical purposes the results were quite similar to those reported by previous observers, with the single difference that the disease appeared to be definitely more virulent in this series. This is indicated by the higher maximum temperatures, the greater incidence of chest pain, bloody sputum and complications which these patients developed (chart 2; tables 1 and 2).

Approximately two thirds of this series had a gradual onset with a history of an upper respiratory infection for days or weeks followed by the development of incapacitating malaise, chilliness, fever, cough and chest pain. In one third of the group these symptoms appeared abruptly, requiring early hospitalization. Severe headache was frequently present and at times associated with meningeal signs. Occasionally the possibility of an associated purulent meningitis could be excluded only by spinal puncture.

TABLE 1.—*Atypical Pneumonia: Frequency of Occurrence of Symptoms in 297 Cases*

	Symptoms	Percentage of Occurrence
Onset	Gradual	67.2
	Acute	32.8
Constitutional symptoms	Feverishness	85.5
	Malaise	70.4
	Chilliness	68.0
	Headache	48.0
	Rigor	11.5
Symptoms referable to respiratory tract	Cough	86.2
	Sputum	
	Nonbloody	49.0
	Blood streaked	23.9
	Bloody	2.4
	Prune juice	0.4
	Coryza	49.0
	Sore throat	47.0
	Thoracic pain	69.5
	Substernal	20.4
	Pleural on motion	47.7
	Thoracic on rest	11.2

Physical findings initially were often confusing. Fever was almost invariably present. The most helpful localizing symptom was the presence of rales (56.2 per cent), which varied in character but most typically were dry and crackling and occurred in showers near the end of inspiration. It was observed that they could often be brought out by coughing when not otherwise present. Dulness to percussion was present in 25 per cent of the cases. Dyspnea was detected in 21.7 per cent and diminished breath sounds in 19 per cent. Signs of consolidation or fluid and the presence of a friction rub were noted infrequently.

The initial diagnosis was frequently one of exclusion as x-ray findings and definite localizing physical signs were not present until several days after the onset of the disease. A summary of the symptoms and physical findings is given in tables 1 and 2.

LABORATORY PROCEDURES OF VALUE IN THE MANAGEMENT OF PRIMARY ATYPICAL PNEUMONIA

As Dingle and others [1] have shown, the white blood cell count and differential counts are of little value in uncomplicated primary atypical pneumonia. The experiences in this series of cases was a similar one. The white blood cell count was usually normal and less frequently slightly elevated. No constant help or significant changes were noted in the differential counts. Sputum examinations and blood cultures were useful when positive in determining primary or secondary pneumonias of bacterial origin.

Valuable information for controlling the management of these cases can be obtained from sedimentation tests done at weekly (or shorter) intervals. In the acute stage of the disease the sedimentation rate is invariably elevated and ranges from 20 to 40 mm. per hour. As the disease improves this gradually returns to normal, and with recurrences or reactivation it shows secondary rises which can be correlated with clinical and x-ray findings.

TABLE 2.—*Atypical Pneumonia: Frequency of Occurrence of Physical Signs in 297 Cases*

Signs	Percentage of Occurrence
Fever	97.6
Rales	56.2
Dulness	28.0
Dyspnea	21.7
Diminished breath sounds	19.0
Consolidation	9.8
Friction rub	7.7
Fluid	6.1
Cyanosis	3.6
Meningeal signs	0.4

By the routine use of this sedimentation test it is possible to follow the progress of atypical pneumonia as satisfactorily as by the routine use of periodic chest plates. This substitution is particularly important because of the present shortage of film and the need for conserving this most valuable material. In the uncomplicated case, films are needed only for diagnostic corroboration, and confirmation of pulmonary clearance before discharge.

Table 3 indicates variations in sedimentation rate correlated with temperature, x-ray and clinical findings in a patient with two recurrences.

THERAPEUTICS DURING THE ACUTE STAGE

Therapy during the acute stage of the disease varied from expectant and symptomatic to the use of the sulfonamides in doses large enough to maintain an adequate level. There was no strikingly effective therapeutic agent found.

TABLE 3.—*Atypical Pneumonia: Case of Recurrence*

Date	Temperature	X-Ray Diagnosis	W. B. C. (× 1,000)	Sedimentation Rate	Physical Examination
3/16	103	Atypical pneumonia, left base	8.8	25 mm.	Rales, left base
3/20	103.8	.....	4.0	.....	Rales, left base
3/22	99	.....	6.1	11 mm.	Rales, left base
3/24	98.6	No change	...	.....	Rales, left base
4/12	98.6	Slight flareup, left base	...	21 mm.	Rales, left base
4/25	98.6	.....	4.4	14 mm.	Chest clear
4/26	98.6	Resolution not complete	...	.....	Chest clear
5/11	98.6	Chest clear	4.9	7 mm.	Chest clear
5/28	101	.....	...	.....	Rales, left base
6/ 1	98.6	Recent pneumonia, left base	...	28 mm.	Rales, left base
6/ 9	98.6	Resolution not complete	...	19 mm.	Rales, left base
6/16	98.6	.....	...	17 mm.	Rales, left base
6/22	98.6	Chest clear	...	8 mm.	Chest clear

Because of its apparent success in some of the more toxic febrile cases observed by two of us (G. C. E. and E. P. R.) its possible effectiveness against secondary invaders and its low toxicity, sulfadiazine was used as the therapeutic constant in all cases in which the temperature rose to 102 F. or higher.

Moderate cough and expectoration was considered a helpful physiologic reaction in the bronchitic and atelectatic aspects of the disease. Therefore ammonium chloride was used as an expectorant, and the sedative and narcotic cough medicines were avoided. (It has been shown by one of us [8] that the use of narcotics in upper respiratory infections is contraindicated. In a series of upper respiratory infections associated with the present epidemic the incidence of pneumonia was significantly increased in cases treated with opiates [powder of ipecac and opium, Dover's powder].) Rest alone has been enough to quiet the unproductive cough in most cases. Codeine and morphine have been used only in cases of severe cyclic cough which disturbed sleep, in gross hemoptysis and in acute pleural pain.

We have frowned on the use of coal tar antipyretics as ineffectual and misleading. The excessive diaphoresis which accompanies their routine use in atypical pneumonia produces a wasteful loss of salts and fluids and sometimes throws the patient into a depressed debilitated condition which we believe counteracts the very symptomatic relief which is desired. Accordingly, acetylsalicylic acid is reserved for symptomatic relief when indicated rather than as a routine measure.

TABLE 4.—*A Comparison of Results of Treatment by Prolonged Bed Rest with Treatment of a Conventional Character*

	Prolonged Bed Rest		Conventional Management	
Type of Case	Number of Patients	Average X-Ray Clearance Time	Number of Patients	Average X-Ray Clearance Time
Uncomplicated	149 *	30.90	110	34.20
Recurrence of pneumonia	5 † (2.6%)	54.00	44 (23.3%)	51.55
Other complications	38 ‡ (18.5%)	52.70	38 § (18.5%)	52.00
Total	192	33.55	192	41.55

* In 9 cases there was no x-ray evidence of disease. Diagnosis was made on physical findings. These cases not included in computation of average period of x-ray clearance.

† Includes 2 patients who developed effusion during acute stage of disease.

‡ One death and 2 cases of bronchiectasis are not included in computing x-ray clearance time.

§ Three cases of bronchiectasis are not included in computing x-ray clearance time.

The usual therapeutic indications in pneumonia have governed our use of oxygen, intravenous fluids and blood plasma.

THE MANAGEMENT OF THE ACTIVE (POSTFEBRILE) PERIOD

A very important factor contributing to the long period necessary for recovery of the patients with atypical pneumonia seen at Jefferson Barracks was the frequent recurrences which developed under conventional treatment. A recurrence was arbitrarily defined as a febrile rise of 100 F. or more appearing after ninety-six hours of normal temperature with clinical or x-ray signs of an extension or reactivation of the pulmonary process. Studies were made to determine the optimum method of postfebrile care for the prevention of these complications (other phases of this study are still in progress).

Because of the relatively chronic nature of the pulmonary process in atypical pneumonia and the proved value of rest in pulmonary tuberculosis, it was decided to determine whether these patients would benefit by a prolongation of the usual postfebrile period of bed rest.

For the purpose of study, our controlled cases were divided into four arbitrary stages: acute (until free from fever for four days), active (until fever free for fourteen days), subsiding (after fourteen afebrile days and until physical examination, x-ray and sedimentation rate were normal) and convalescent (from subsiding stage to full duty).

The following physical arrangements were made: All patients developing pneumonia were transferred to "acute pneumonia wards." On admission to these wards patients were alternately labeled as "ambulatory" or "bed rest" and they retained this designation during their period of hospitalization. The entire group was kept at complete bed rest until they had been free from fever for four days. Then those designated as "ambulatory" and "bed rest" were separated, and each group was sent to a different ward for controlled study. At this point the occasional patients who had been found to have pneumococcic pneumonia were dropped from the series.

The ambulatory group (who had had four afebrile days of bed rest before transfer) were then permitted to get up when and as they felt like doing so, there being no compulsion to do more than appealed to them. In the event of a recurrence or reactivation of the pulmonary process they were returned to the acute pneumonia wards and passed through the cycle of acute treatment again.

The group sent to the "bed rest" ward were kept in bed for an additional ten days (total fourteen days). This period of time was selected arbitrarily. Following this they were permitted to get up when and as they felt like doing so.

After both groups were ambulatory they were transferred to the "subsiding" wards for further care.

The results in this controlled study of 384 cases is summarized in table 4. In the group treated by prolonged bed rest the percentage of recurrence was 2.6 and in the group treated by a conventional type of care the percentage of recurrence was 23.3.

In spite of the delay in becoming ambulatory, the decrease in recurrences reduced the average period of hospitalization in the "bed rest" group to 33.55 days as compared to 41.55 days in the "ambulatory" group.

This procedure was set up for statistical purposes and obviously did not necessarily represent the ideal method of managing the individual patient, as it does not give consideration to variations in the virulence of the disease or the resistance of the individual patient. After the completion of this statistical study we adopted the policy of keeping all patients with active atypical pneumonia at bed rest and isolated until their sedimentation rate has decreased to 10 mm. or less in one half hour.

TREATMENT DURING THE SUBSIDING AND CONVALESCENT STAGES (USE OF CONVALESCENT TRAINING PROGRAM [9])

Since rest seemed to be so important during the "active" stage of the disease, at the beginning of this study the tendency was to limit activity during the "subsiding stage" as well. Physical rehabilitation was not begun until the pneumonia was entirely resolved. A graduated program of convalescent physical training

8. Rusk, Howard A., and van Ravenswaay, Arie C.: Sulfadiazine in Respiratory Tract Infections: Its Value in Treatment During Winter 1942-1943 at Jefferson Barracks, Missouri, J. A. M. A. **122**: 495-496 (June 19) 1943.

9. This program is an integral part of the Convalescent Training Program now operating in all Army Air Force hospitals and is administered by a trained group of officers and enlisted men under close medical supervision.

was established in the country (Camp Babler) to which patients were sent after discharge from the Station Hospital. This worked out very well, and patients were returned to duty in much better condition than before this program was instituted. However, by experimentation and observation it was found that it was unnecessary to wait until x-ray and physical findings had completely cleared before beginning physical reconditioning and that patients who had been afebrile for fourteen days could tolerate exercise without reactivation and that clearing by x-ray proceeded as rapidly as it did in those on the less vigorous program.

Ultimately it appeared, as previously stated, that a thirty minute sedimentation reading of 10 mm. or below was a more satisfactory criterion for determining the beginning of the "subsiding" stage than the arbitrary period of fourteen afebrile days. The patient now begins the physical portion of his convalescent training program at this point. The rapidity of his progress on the road to physical rehabilitation is regulated by his exercise tolerance.

At present a twelve day physical reconditioning program [9] in the hospital is used during the "subsiding" phase of the disease. In this the first five days are a preconvalescent or test period. If the exercise tolerance is good and the sedimentation rate continues to drop during this test period, the patient continues with increasing stages of physical activity to approximate general military duty by the twelfth day of the program. When the sedimentation rate at sixty minutes is 10 mm. or below and exercise tolerance is excellent, the final x-ray film is taken before discharge to duty. Organized lectures, demonstrations, movies and entertainment are a part of the convalescent program. Thus, manpower hours of useful training are salvaged and morale is maintained. The patients are enthusiastic, ward morale is high, manpower conservation gratifying. The individual convalescent is observed and regulated by his ward officer during the program, and his exercise tolerance evaluated before general duties are assumed.

By means of the sedimentation rate we have been able to anticipate x-ray clearance and exercise tolerance so that clear chest plates, normal sedimentation and full duty exercise tolerance all obtain at nearly the same time. This has saved two or three weeks of noneffective days per patient.

The study has given us some insight into the behavior of the infectious process in the various stages. The "acute" stage appears to be the most infectious; the "active" stage is still infectious and is accompanied by lowered resistance, as is shown by reactivation with exercise and cross infection. The "subsiding" stage is apparently noninfectious, resistance is raised against cross infection; graduated exercise is well tolerated so that full activity may be achieved by the time the x-ray film is clear, when a proper program is provided and the patient carefully followed.

COMPLICATIONS

That the atypical pneumonia of Jefferson Barracks of 1942-1943 has been more virulent than most reported series is borne out by the greater number of acute and seriously ill patients, increased x-ray clearance time (table 5), increased frequency of bloody sputum, cyanosis and chest pain, as well as complications. Of 493 consecutive patients admitted after March 10, 1943 (378 of whom had been discharged by August 10) the most frequent complication was the development of pleural fluid. There were 48 (9.7 per cent) cases corroborated by x-ray examination; of those 13 (2.6 per cent) showed massive effusions requiring thoracentesis and of the latter number 7 (1.4 per cent) in which empyema developed requiring surgery (rib resection). The importance of these pleural complications can be measured in hospital days. While thirty-two days was the average time for chest clearance by x-ray examination in the uncomplicated cases, pleural effusion, even minimal, raised the figure to forty-six days. Empyema with its incident operations and slow healing raised the figure to two and one-half to four months, not counting the necessary prolonged convalescent period before active duty. Recurrence and reactivation carried with them an average x-ray clearance time of fifty-two days. These complications occurred in 23 per cent of these patients who were permitted to become ambulatory after being afebrile for four days and in only 2.6 per cent of those treated with prolonged bed rest. The inevitable conclusion is that atypical pneumonia patients should be treated in bed until the sedimentation rate shows quiesence.

Residual localized chronic bronchitis and bronchiectasis were serious complications which occasionally occurred. There were 3 cases of the former and 11 of the latter. Both were characterized by persistence of cough and expectoration, especially in the morning, and poor exercise tolerance. Physically and roentgenologically the two conditions are indistinguishable. The bronchogram alone can differentiate them. Physical findings invariably showed a definitely localized area of moist and bronchial rales, with or without dulness. X-ray films either were normal or showed increased bronchial markings in the area or a persistent shadow, interpreted as unresolved pneumonia. These complicating processes did not prevent the characteristic return to normal of the sedimentation rate coincident with the resolution of the initial pneumonic process. The bronchogram revealed the local damage in the cases of bronchiectasis and showed a relatively normal bronchial tree with more or less peribronchial infiltration in the cases of chronic residual bronchitis. Whether the latter group will ultimately develop bronchiectasis cannot be predicted. We recognize these cases as troublesome, manpower wasting and relatively intractable to therapy. Seven of the 11 patients in the bronchiectasis group gave a history of intermittent or continual chronic dry or productive cough extending over months to years,

TABLE 5.—*Summary of Complications Arising in 493 Consecutive Cases of Primary Atypical Pneumonia from March 10 to Aug. 20, 1943*

Type of Case	Number	Per Cent	X-Ray Clearance Time *
Uncomplicated	315	63.8	32.15
Recurrence	60	12.1	52
Effusion	41	9.7	51
Massive effusion	13	2.6	
Empyema	7	1.4	
Bronchiectasis	11	2.2	98 †
Localized postpneumonic chronic bronchitis	3	0.6	
Chronic fibrous pleuritis with deformity	2	0.4	
Hemoptysis (gross)	1	0.2	
Measles	12	2.4	55
Otitis media	4	0.8	16
Hemolytic streptococcus infections (scarlet fever, pharyngitis and so on)	6	1.2	13
Deaths	2	0.4	
Others	36	7.2	
Total	493	100.00	

* These figures are based on patients discharged from the hospital with clear x-ray films by Aug. 10, 1943.

† In this instance 98 days represents the average period of hospitalization before discharge with x-ray diagnosis of bronchiectasis.

which was compatible with preexisting bronchiectasis. The remainder had no past history suggestive of chronic pulmonary pathologic changes. In the absence of a suitable x-ray examination before the onset of the atypical pneumonia it is impossible to determine accurately how many of this group had preexisting bronchial damage. It seems probable that at least 4 developed bronchiectasis during their hospitalization. Certainly all are incapacitated now by poor exercise tolerance, when previously they could exercise vigorously without symptoms.

In this series 2 cases of thin walled abscesses developed. Acid fast and coccidiomycotic factors were ruled out. The patients are still under observation and appear to be making spontaneous recovery, although full x-ray clearance has not been obtained. There was 1 patient with unexplained massive and continued hemoptysis requiring three blood transfusions. This patient has now returned to full duty with complete healing.

In the controlled group 2 cases of nonspecific urethritis (presumed to be viral in etiology since no bacterial cause could be found) and 1 case of Stephens-Johnson syndrome (conjunctivitis, and stomatitis associated with atypical virus pneumonia) represented the only extrapulmonic complications of our series.

There were 2 patients with acute abdominal localization of pain who were conservatively followed by the surgical department. Atypical pneumonia apparently accounted for all their symptoms.

INTERCURRENT INFECTIONS

The study of intercurrent infections in our controlled series has revealed some interesting figures, which may point the way to rational therapy for atypical pneumonia. These figures do not lend themselves to absolute statistical evaluation in all cases but suggest a trend which we believe is possibly significant. Remembering that the x-ray clearance time of uncomplicated cases was approximately thirty-two days, the presence of measles, red or German, raised that time to from forty-three to seventy-three days (average fifty-five days for 12 patients). Syphilis, another depressor of resistance and white blood cell count, was accompanied by very slow clearing, as would be expected. However, streptococcic diseases, scarlet fever and streptococcic pharyngitis had a much shorter period of clearance, varying from ten to fourteen days (average thirteen days for 6 patients). Cases accompanied by acute otitis media showed an x-ray clearance period of six to twenty days (average sixteen days for 4 patients). We have noticed in our series of cases of primary atypical pneumonias that those patients with higher degrees of fever and higher white blood cell count cleared more quickly and that a rising white blood cell count was a good prognostic sign. Will raising fever or maintaining it and stimulating polymorphonuclear response constitute a helpful alterative effect? We are about to investigate these possibilities.

CONCLUSIONS

1. The primary atypical pneumonia, causation undetermined, seen in 1,862 cases at Jefferson Barracks during the period from June 1, 1943 to Aug. 10, 1943 was more virulent than in other reported series.

2. For optimum results the clinical management of primary atypical pneumonia of the type seen at Jefferson Barracks during the past year should include a more prolonged period of postfebrile bed rest than ordinarily is indicated in pneumoncoccic pneumonia of similar age groups.

3. The determination of the sedimentation rate is a useful laboratory procedure for following the course of this disease.

4. The judicious use of a physical reconditioning program during the subsiding and convalescent phases of primary atypical pneumonia is an important adjunct in shortening hospitalization and reducing the incidence of recurrence.

THERAPEUTIC CURE OF ACUTE EXPERIMENTAL TOXOPLASMOSIS IN ANIMALS

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The disease toxoplasmosis is almost invariably fatal in man. Therapy has been unsuccessful; in the few recoveries which have occurred there is no convincing evidence that this outcome was appreciably influenced by the nonspecific medication employed. A principal cause for failure of therapy may well have been the short period in which the patients were available for treatment, since death has often followed the appearance of the initial symptoms within a few days. Practically, therefore, decidedly beneficial results in man may be expected only from those drugs which in animals have experimentally been proved effective when administered during the acute disease and shortly before death.

In this report it will be shown that appropriate sulfonamides will cure a high percentage of otherwise fatally infected animals even when treatment is instituted a few days before the date of expected death. It is felt that these results warrant thorough trial of the same treatment in human cases.

The first record, to our knowledge, that the sulfonamides were at all effective in vivo is that of Sabin and Warren.[1] These authors experimented with mice, adding different sulfonamides to the diet. They observed a notable prophylactic effect but were unable to effect cures if administration of the drug was delayed beyond the second day after infection. Carried over to man, this would signify probable ineffectiveness once symptoms were present. Five rabbits were treated as late as the third day after infection; 3 which received drug in the diet died, while 2 injected intraperitoneally survived. Study of the data of these authors suggested that blood levels adequate for maximum benefit may not have been obtained, so that the method of administration rather than ineffectiveness of the drug was primarily responsible for the unsatisfactory results. The present study was undertaken to test this very point.

METHODS AND MATERIALS

In order to reproduce the conditions in which human patients become available for treatment, therapy was initiated late in the course of the infection. The period of expected survival was determined and the initial dose given to some animals at the expiration of the first third of this period, to others at the end of the second third, and others received it at various later intervals.

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1. Sabin, A. B., and Warren, Joel: Therapeutic Effect of the Sulfonamides on Infection by an Intracellular Protozoon (Toxoplasma), J. Bact. **41**: 80 (Jan.) 1941; Therapeutic Effectiveness of Certain Sulfonamides on Infection by an Intracellular Protozoon (Toxoplasma), Proc. Soc. Exper. Biol. & Med. **51**: 19-23 (Oct.) 1942.

Sulfapyridine, sulfathiazole and sulfadiazine were suspended in cottonseed oil and injected subcutaneously; the more soluble sodium salts, after dissolution in saline solution, were injected intraperitoneally. Administration was either twice daily at twelve hour intervals or in some instances three times a day spaced eight hours apart. Blood levels of the drugs were determined by the methods described by Bratton and Marshall.[2]

The toxoplasma strain, originally isolated from guinea pigs, is regularly fatal to mice following intraperitoneal injection of adequate doses. This route was used for all the mice reported. In the case of this organism it is impossible to state in a very exact way the injected doses, since the infective agents are not distributed uniformly in an inoculum or freed from the tissue in which they occur. Nonetheless an approximation was obtained for the mice reported in series 1 by the progressive dilution method, an inoculum of 0.5 cc., as in the therapy experiments, but diluted 1:20,000 still proving fatal. The average survival period of the dying untreated controls in series 1 was fifteen days. In series 2 the dilution method was not employed; since, however, untreated controls died in sixteen days, the infective dose was probably of the same magnitude in the two series.

At the conclusion of the experiment survivors were tested for chronic infection by direct examination of the brain. This, if negative, was complemented by inoculation of mice with other portions of the same brain.

2. Bratton, A. C., and Marshall, E. C., Jr.: A New Coupling Component for Sulfanilamide Determination, J. Biol. Chem. **128**: 537-550 (May) 1939.

RESULTS

With the first series of infected animals, treatment was delayed until the fifth day after infection. Untreated controls died in an average of fifteen days. In other words, treatment was begun at the expiration of one-third the period of expected survival.

The results with sulfapyridine were strikingly successful. Of 17 mice treated with sulfapyridine in oil or with sodium sulfapyridine, 16 survived throughout the observation period, which was set at twenty-eight days, being a convenient period nearly double that in which the average control death occurred. This represents a therapeutic cure rate of 95 per cent. Of the 6 untreated controls, 1 unexpectedly recovered and the others died, the spontaneous recovery rate being 17 per cent. Details of treatment are given in table 1.

These results were so promising that we were led to see how late in the infection therapy might still be effectively instituted. In this second series the 5 controls died in an average period of sixteen days. The treated mice received sulfapyridine in oil ten, twelve, thirteen or fourteen days after infection. Of the 6 treated mice in this set half died in the ame period as the controls, but 50 per cent survived during an observation period prolonged in this instance to eighty-five days. Of these mice, 2 received the first treatment as late as the thirteenth day after infection, that is, three days before their anticipated death; both recovered, as may be seen in table 2.

In all these experiments the period of administration of the drug varied from six to nine days. There is no indication that the longer period was advantageous therapeutically, and, since the drugs are toxic, the shorter period is to be preferred.

TABLE 1.—*First Series*

Drug	Number of Mice	Day Treatment Began *	Daily Dose per Mouse	Period of Therapy	Blood Levels: Day of Treatment	Blood Levels: Hours After Injection	Blood Levels: Mg. Drug / 100 Cc. Blood	Survivors Observation Period (28 Days)
Sodium sulfapyridine	6 (4350)	5	2 × 0.010 Gm. for one day = 0.02/day 3 × 0.010 Gm. for two days = 0.03/day 2 × 0.010 Gm. for three days = 0.02/day	Six days	...	..	....	6
	5 (4349)	5	2 × 0.010 Gm. for one day = 0.02/day 3 × 0.010 Gm. for two days = 0.03/day 2 × 0.010 Gm. for six days = 0.02/day	Nine days Nine days	2 5 7 7	6½ 3 7½ 12	15.0 25.0 11.0 10.5 (approx.)	4 1 death with evidence of drug toxicity
Sulfapyridine in oil	6 (4345)	5	2 × 0.015 Gm. for nine days = 0.03/day	Nine days	5 7	3 11	7-15.6 12.2	6
Controls	6 (4344)	None	None	None	...	..	....	1
						Average death 15.2 days		

* Counted from and including the day of infection.

TABLE 2.—*Second Series*

Drug	Day of First Dose *	Number of Mice	Daily Dose	Period of Administration	Outcome
Sulfapyridine in oil	10	2	0.015 Gm. × 2 at 12-hour intervals = 0.03/day	9 days 3 days	1 survived 85 days Dead 13th day (treatment ineffective)
	12	1	0.015 Gm. × 2 at 12-hour intervals = 0.03/day	7 days	Dead 20th day (treatment ineffective)
	13	2	0.015 Gm. × 2 at 12-hour intervals = 0.03/day	5 adys	2 survived 85 days
	14	1	0.015 Gm. × 2 at 12-hour intervals = 0.03/day	5 days	Dead 17th day (treatment ineffective)
Sulfathiazole in oil	10	2	0.02 Gm. × 2 at 12-hour intervals = 0.04/day	2 days	All died as if untreated within 24-48 hours after first dose †
	12	1	0.02 Gm. × 2 at 12-hour intervals = 0.04/day	1 day	
	13	1	0.02 Gm. × 2 at 12-hour intervals = 0.04/day	1 day	
	14	2	0.02 Gm. × 2 at 12-hour intervals = 0.04/day	1 day	
None (control group)	..	5	0	.....	No recoveries; average death 16 days

* Counted from and including the day of infection.
† Sulfathiazole blood levels (uninfected mice) 7 hours after last injection 7.95 to 9.45 mg. per hundred cubic centimeters of blood; 12 hours after, 10.2 to 10.5 mg. per hundred cubic centimeters.

Blood levels with sodium sulfapyridine varied between 10.5 and 25.0 mg. in 100 cc. of blood. In terms of milligrams per hundred cubic centimeters, at different intervals after injection, the blood levels on the twice daily schedule were at 3 hours 25.0, at 6½ hours 15.0, at 7½ hours 11.0 and at 12 hours approximately 10.5. With sulfapyridine in oil given at noon and midnight, the blood levels did not rise as high or drop as low as with the sodium salt. Three hours after injection the blood level varied between 7.0 and 15.6 mg. per hundred cubic centimeters, at 5½ hours it was 15.0 and at 11 hours 12.2.

Trials with other sulfonamides were not sufficiently extensive to permit of any final conclusion. With sodium sulfadiazine we were able to cure nearly all mice of a small batch when treatment was commenced the fifth day. It is of particular interest that this result was obtained after only three days of treatment, the mice receiving 0.02 Gm. the fifth day in two equal doses twelve hours apart, 0.03 Gm. on the sixth in three equal doses at intervals of eight hours, and a single dose of 0.01 Gm. on the seventh day. While these results are encouraging, the amounts injected, although reported to be safe, were found to be dangerously near the toxic dose, blood levels rising to above 20 mg. per hundred cubic centimeters three hours after injection. It is possible that smaller safer doses might prove effective. Sulfathiazole in oil started on the tenth, twelfth, thirteenth or fourteenth days after infection cured no mice; the blood levels obtained, 8.75 mg. per hundred cubic centimeters at 7 hours and 10.4 at 12 hours, were perhaps too low for maximum benefit. As already noted, mice treated with sulfapyridine ten to fourteen days after infection were cured in about half the cases; however, the blood concentrations attained varied between 7.0 and 15.6 mg. per hundred cubic centimeters.

CHRONIC INFECTION OF CURED MICE

Recently one of us has shown [3] that mice receiving very small doses of virulent toxoplasmas will recover but remain carriers, the infection persisting as an inapparent one for long periods of time. When the carriers died or were killed and the viscera examined, the brain in every instance was found to be heavily infected with living virulent organisms. Other data were presented which indicate that the carrier state may exist in man.

The question naturally arose whether in the present experiments the sulfonamides in effecting a cure of the disease eradicated the infection or only aided in producing the carrier state. The evidence is unequivocal; we have no proved case of sterilization of the infection, for in every instance tested the cured mice were found to be carriers. The toxoplasmas were present in the brain, being usually quite numerous and shown in every test to be virulent by passage to new mice.

This result was obtained whatever the drugs used: sulfapyridine, sodium sulfapyridine, sodium sulfadiazine and sulfathiazole. It also seemed to be independent of the length of the period of administration as well as of the dose of drug and was found to occur even in experiments (not otherwise reported in this paper) in which the drug was given prophylactically before infecting the animals. It seems justified to conclude, therefore, that the sulfonamides cannot be relied on to eradicate the carrier state.

3. Weinman, David: Chronic Toxoplasmosis, J. Infect. Dis. **73**: 85-92 (July-Aug.) 1943.

CONCLUSIONS

1. Sulfapyridine is strikingly successful in curing acute toxoplasmosis in mice.

2. The recovery rate is the higher the earlier in the course of the disease treatment is started. When treatment is initiated at the expiration of one-third the period of expected survival, nearly all animals recover. If treatment is delayed beyond the end of the second third of this period, only half the animals survive. However, some animals are cured by sulfapyridine administered as late as three days before expected death.

3. Therapy cures the disease but it does not sterilize the infection. The cured mice remain carriers and retain virulent organisms in the brain.

4. The results appear to warrant use of the sulfonamides in treating human acute toxoplasmosis.

SULFADIAZINE IN THE TREATMENT OF THE COMMON COLD

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The common cold derives its medical importance chiefly from the fact that it is followed so frequently by secondary infection. The uncomplicated cold, now generally accepted as caused by a filtrable virus, runs a mild course, usually afebrile, and clears up completely in four to seven days. On the other hand, a cold complicated by a secondary bacterial infection which may involve the sinuses, middle ear, mastoids, larynx or lungs can lead to a fatal outcome. It is evident, therefore, that the cold problem would be greatly simplified if all colds could be retained in the uncomplicated form by some relatively harmless medication. The value that sulfadiazine, the least toxic of the sulfonamides, might have in this role is the consideration of this study.

It is generally agreed that the sulfonamides have little or no effect on the virus initiating the common cold, but it has been accepted that they are effective agents against the pneumococcus and the hemolytic streptococcus. Also there is evidence that they are effective, but to a lower degree, against Haemophilus influenzae and the hemolytic staphylococcus, the other two most common secondary invaders of the respiratory tract following colds.

The literature on the use of the sulfonamides in acute coryza per se is comparatively meager, although its use in localized disease of the respiratory tract following colds is quite extensive. But even in such common conditions as tonsillitis and sinusitis there is no unanimity of opinion regarding the indications and value of the sulfonamides. In 1937 Long and Bliss [1] reported favorably on the use of sulfanilamide by mouth in acute pharyngitis and tonsillitis. On the other hand,

From the Medical Service of the New York Hospital and the Departments of Medicine and Public Health and Preventive Medicine of Cornell University Medical College.

1. Long, P. H., and Bliss, Eleanor A.: Para-Aminobenzenesulfonamide and Its Derivatives: Clinical Observations on Their Use in the Treatment of Infections Due to Beta Hemolytic Streptococci, Arch. Surg. **34**: 351 (Feb.) 1937.

Rhoads and Afremow [2] in a controlled series of cases of pharyngitis and tonsillitis found that sulfanilamide did not lessen the severity of symptoms, reduce the incidence of complications or shorten the duration of the carrier state. Kernan [3] found that sulfanilamide orally did not alter the ordinary course of tonsillitis but that complications were fewer when it was used. This opinion is the one most commonly accepted today, even though there have been improvements in sulfonamide therapy through the introduction of drugs more effective and less toxic than sulfanilamide.

In sinusitis there is particularly great divergence of opinion on the value of the sulfonamides. Turnbull [4] reported that a large proportion of patients with chronic sinusitis were benefited by spraying the nasal cavities with a 5 per cent solution of sodium sulfathiazole. No untoward effects were observed in Turnbull's series of 47 cases. This enthusiasm for the local use of the sulfonamides in chronic sinus infection has not been borne out by later reports, and there have been studies indicating that a 5 per cent sodium sulfathiazole solution is deleterious to the mucous membranes. Gundrum [5] tested the effect of sulfonamide preparations on the nasal mucous membrane of rabbits and found that sodium sulfathiazole in 4.7 per cent solution was locally destructive following nasal instillation. Sodium sulfadiazine, while not so frankly destructive, was also injurious. Otolaryngologists are in greater accord on the value of the sulfonamides in acute sinusitis and in acute otitis media. Bowers [6] believes that they exert their effect most strikingly in fulminating sinus infections and that in acute otitis media, if oral chemotherapy is instituted early, the duration of discharge and the number of mastoidectomies are both reduced by 50 per cent. For local use Bowers [6] prefers sulfadiazine or sulfathiazole powder applied directly to the mucous membranes. Silcox and Schenk [7] have used a 5 per cent suspension of microcrystalline sulfathiazole for the treatment of acute and chronic sinusitis, the suspension being instilled directly into the sinuses. In addition to the differences of opinion over the relative value and safety of the different sulfonamides in their crystalline and liquid forms, the relative value and safety of oral and local administration remains highly controversial.

The value of the routine use of the sulfonamides in the treatment of the common cold has been widely speculated on in medical circles, but very little detailed investigation has been carried out on this problem. Bordley, Crowe, Dolowitz and Pickrell [8] at Johns Hopkins Hospital treated a small alternate group of nurses coming down with colds by spraying the pharynx and nasal passages with a 2.5 per cent sulfadiazine in 8 per cent triethanolamine solution. In addition to definite symptomatic relief they observed a reduction in complications and a decrease in the secondary bacterial invaders in the nasopharynx, particularly the hemolytic streptococcus. While this study is very suggestive, it is not convincing because of the small number of cases included. Furthermore, the method of treatment reported is not entirely practical because in order to obtain results it is necessary to spray the pharynx eight times daily for the first two days and then five or six times for three days.

Rusk and van Ravenswaay [9] have recently published their results on the oral use of sulfadiazine in the treatment of acute febrile respiratory infections which were seen in a large army station hospital during the winter of 1942-1943. Doses of drug (3.0 Gm. initially followed by 1.0 Gm. every four hours) similar to those used in pneumonia were administered until improvement occurred. In the 317 treated patients compared with 314 comparable controls the authors observed no significant difference in either the length of the febrile period or in the period of hospitalization. Contrariwise, Siegel [10] observed decided differences with and without sulfadiazine in alternate groups of feebleminded children with acute febrile respiratory infections, to which such individuals are particularly susceptible. In this reported series the incidence of serious secondary infections and the duration of the febrile period were considerably lessened.

This brief summary of the literature indicates that the exact role of the sulfonamides in the treatment of upper respiratory infections has not been accurately determined. Our purpose in this study has been (1) to determine the effects of small oral doses of sulfadiazine on the nasopharyngeal flora of persons suffering from acute coryza and (2) to ascertain, if possible, the indications for the use of sulfonamide therapy in upper respiratory tract infection, estimating the benefits to be expected in such cases from this therapy.

METHOD

The subjects were volunteers from the personnel of the New York Hospital.[11] They attended a "cold clinic" where they could be studied and treated systematically. To the majority of them colds had become a serious problem because of their frequency and severity.

At the beginning of observation a detailed respiratory history was taken and a careful examination [12] of the upper respiratory tract was made. At the start of therapy and every second or third day during the follow-up, the following procedures were carried out:

1. Oral temperature.
2. Complete blood count on all those actually receiving sulfadiazine, and hemoglobin determination on the others.
3. Record of symptoms with their intensity at time of visit.
4. Examination of the upper respiratory tract.
5. Nasopharyngeal culture.

In addition, gross and microscopic urine examinations were made at the start, and later examinations were made if there was indication for them. Also the levels of sulfadiazine in the blood were determined twice during the course of therapy by a micromodification of the

2. Rhoads, P. S., and Afremow, N. S.: Sulfanilamide in Treatment of Sore Throat Due to Hemolytic Streptococci, J. A. M. A. **114**: 942 (March 16) 1940.

3. Kernan, J. D.: Infections of the Mouth, Pharynx and Upper Respiratory Tract, Bull. New York Acad. Med. **17**: 674 (Sept.) 1941.

4. Turnbull, F. M.: Intranasal Therapy with Sodium Salt of Sulfathiazole in Chronic Sinusitis, J. A. M. A. **116**: 1899 (April 26) 1941.

5. Gundrum, L. K.: Effect of the Newer Sulfanilamide Derivatives on the Nasal Mucosa of Rabbits, Arch. Otolaryng. **37**: 209 (Feb.) 1943.

6. Bowers, W. C.: Infections of the Middle Ear and Nasal Sinuses, Preventive Medicine in Modern Practice (edited under the auspices of the Committee on Public Health Relations, New York Acad. Med.), p. 525, New York, Paul B. Hoeber, Inc., 1942.

7. Silcox, L. E., and Schenk, H. P.: Use in Otolaryngology of Microcrystals of Drugs of the Sulfanilamide Group, Arch. Otolaryng. **36**: 171 (Aug.) 1942.

8. Bordley, J. E.; Crowe, S. J.; Dolowitz, D. A., and Pickrell, K. L.: The Local Use of the Sulfonamides, Gramicidin (Tyrothricin) and Penicillin in Otolaryngology, Ann. Otol., Rhin. & Laryng. **51**: 936 (Dec.) 1942.

9. Rusk, H. A., and van Ravenswaay, A. C.: Sulfadiazine in Respiratory Tract Infections: Its Value in Treatment During Winter of 1942-1943 at Jefferson Barracks, Missouri, J. A. M. A. **122**: 495 (June 19) 1943.

10. Siegel, Morris: Studies on Control of Acute Infections of Respiratory Tract: Oral Administration of Sulfadiazine at the Onset of Acute Respiratory Illnesses, Am. J. Dis. Child. **66**: 114 (Aug.) 1943.

11. Our subjects were directed to us through the courtesy and cooperation of Dr. Marian Tyndall of the Nurses Health Service and Dr. Frank M. Falconer of the Hospital Personnel Clinic.

12. These examinations were made by Dr. James A. Moore of the Department of Otolaryngology.

Bratton and Marshall method.[13] This procedure served as an excellent check as to whether the subject was taking the drug as directed.

The treatment as far as the patients knew was the same in all cases. In addition to written directions for the usual symptomatic and hygienic measures they all received an envelop containing 24 tablets with instructions to take 2 immediately and then 2 three times daily (on rising, at midday and at bedtime) until the medicine was gone. At the start of the study all of the subjects

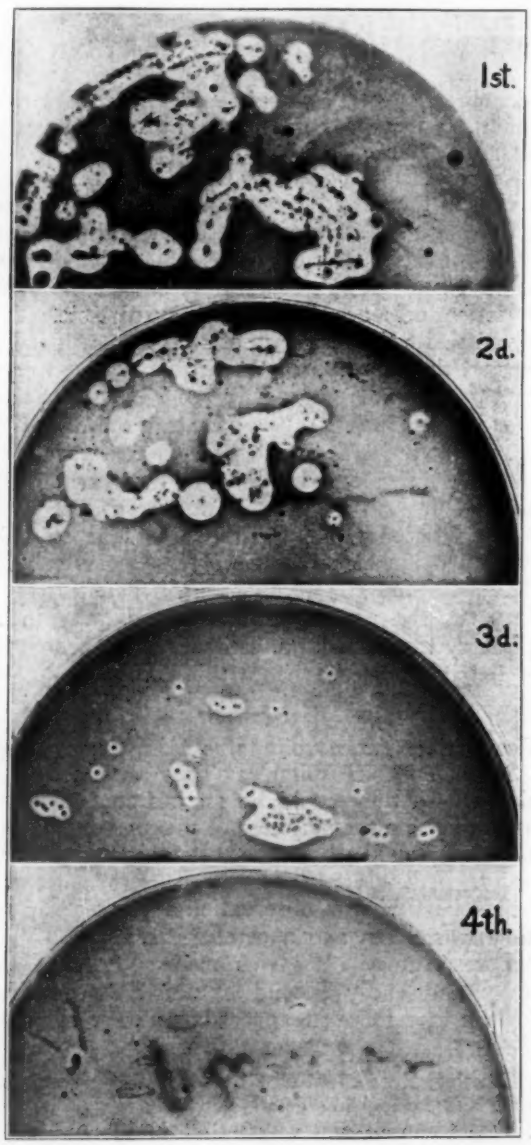

Fig. 1.—Decrease in normal nasopharyngeal flora following oral administration of sulfadiazine 3 Gm. daily for four days.

received sulfadiazine, which meant that they received 1.0 Gm. three times daily for four days, or a total amount of 12 Gm. During the latter part of the study alternate patients received a placebo tablet which could not be distinguished from the drug. The treatment usually was commenced on about the second or third day of the cold when symptoms were established, but a few late cases also were included. The period of time covered by this study extended from October 1941 to June 1942.

13. Bratton, A. C., and Marshall, E. K., Jr.: A New Coupling Component for Sulfanilamide Determination, J. Biol. Chem. **128**: 537 (May) 1939.

Nasopharyngeal cultures were taken at the time therapy was initiated and at frequent intervals (usually every second day) thereafter in order to determine the changes that occurred in the nasopharyngeal flora following the therapy.

CULTURE TECHNIC

A small cotton swab on a curved malleable aluminum wire was inserted into the posterior nasopharynx. West tubes were not used, as it is possible with skill to avoid contamination of the swab with the saliva. The swab was put in a tube of 3 cc. of hormone blood broth. With as little delay as possible a measured amount of this infected broth was spread directly on blood hormone agar plates. The blood broth after incubation for four hours, was also injected intraperitoneally into white mice as a further check on prevalence of the pneumococcus types and other pathogens. The blood agar plates were incubated for forty-eight hours and read. An attempt was made to estimate the number as well as the type of the various pathogenic agents that were encountered. For example, if Haemophilus influenzae (Pfeiffer's bacillus) was encountered the approximate number and relative proportion of these organisms on the plate were determined. The total count and the prevalence of individual pathogens were compared with the findings in each subsequent culture. Serial cultures made it possible to determine any change in either quantity or quality of the organisms found in the nasopharyngeal cultures.

INITIAL CONTROL STUDY

Before initiating the therapy of persons with colds, we gave the drug to a group of 6 normal subjects. Nasopharyngeal cultures were obtained daily to determine the effect of sulfadiazine on normal nasopharyngeal flora. This work was done in August, when pathogens such as pneumococci and beta hemolytic streptococci are normally at a low level in the throat. The striking features of this initial study were:

1. The uniformity of character and relative distribution of various nasopharyngeal organisms in the throat of any given individual.

2. The pronounced reduction of normal nasopharyngeal flora that followed administration of sulfadiazine. When the blood level reached a concentration of 4 to 6 mg. per hundred cubic centimeters the effect of the drug was clearcut.

3. The rapid return of flora to former prevalence and relative distribution within two or three days after the drug was discontinued.

The results of a typical experiment are summarized in figures 1 and 2. In the first illustration photomicrographs of daily blood agar plates from 1 subject show the decrease in the normal nasopharyngeal flora following the administration of sulfadiazine 1 Gm. three times daily for four days. Figure 2 shows the total colony count and correlates it with the dosage and blood levels of sulfadiazine. These illustrations show a striking change during the period of treatment but rapid return of the organisms to their normal pattern after the cessation of drug treatment.

ALTERNATE CASE STUDY

Seventy-two separate colds in 66 persons were treated in the "cold clinic" and carried through a complete series of bacteriologic and clinical observations. In the 72 cases the 3.0 Gm. daily dosage of sulfadiazine was administered to 48 subjects and acceptable blood

sulfonamide readings were made. Nineteen received the control tablets and 5 were given sulfadiazine tablets but the blood level determinations indicated either that the drug was not taken or that it was not absorbed. Therefore, at the start, the cases can be divided into

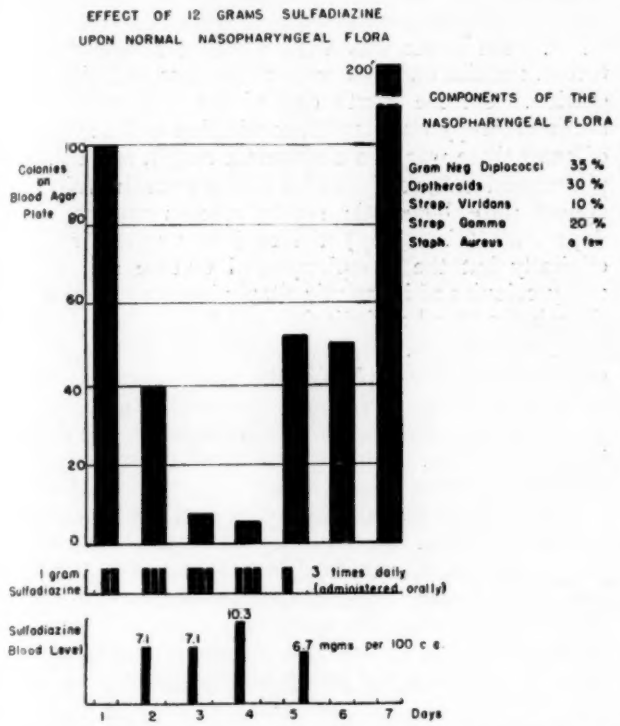

Fig. 2.—Effect of 12 Gm. of sulfadiazine on normal nasopharyngeal flora.

two groups; 48 in which sulfadiazine was administered and 24 in which specific therapy was not administered.

Before analyzing the results in the cases in which sulfadiazine was administered it seemed wise to create a base line for comparison by studying the control series. This group included 24 patients: 19 assigned originally to the control group and 5 from the treated series who, it was evident, did not take or absorb the drug. The bacteriologic findings from the nasopharyngeal cultures in these cases followed a pattern already described by Smillie.[14] Early in the cold and during the stage of the watery secretion from the upper respiratory tract the total bacterial count was reduced. However, after this the total count increased, frequently with a definite predominance of one or more of the pathogens such as the pneumococcus, beta hemolytic streptococcus or Haemophilus influenzae. Of the 24 cases, 4 showed a combination of pneumococcus (types 3, 8, 20 and 21) and H. influenzae, which during the height of the infection appeared on the plates in large numbers. In 8 cases the pneumococcus (types 6, 8, 11, 20 and 31) was isolated in the first examination. The pneumococcus grew out in increased numbers in all instances but 1, in which it disappeared. Haemophilus influenzae was present alone four times and in 2 cases showed increasing numbers on the subsequent cultures. The remaining 8 control cases showed only the usual throat organisms, but in all of these the growth increased during the period of the infection, after the transient decrease.

14. Burky, E. L., and Smillie, W. G.: Nasopharyngeal Flora in Health and During Respiratory Disease in Isolated Communities in Alabama and Labrador, J. Exper. Med. **50:** 643 (Nov.) 1929.

Clinically these 24 patients showed an ordinary run of colds. Several lost time from work, 1 because of a secondary tonsillitis and another because of severe bronchitis and sinusitis with fever. Six developed a moderate but short lasting sinusitis and 2 had a moderate bronchitis. The colds of 11 patients were uncomplicated except that 3 had prolonged sore throats. Three gave such vague descriptions of their symptoms that they could not be used in appraisal of the clinical findings.

A diagrammatic representation of the course of symptoms and changing nasopharyngeal flora in a control case is shown in figure 3. A key to symbols for symptoms and organisms adjoins this graph. In following symptoms, particular attention was given to malaise, sore throat, rhinorrhea, sinus congestion, hoarseness and cough, and each of these symptoms when present was graded as to whether it was slight, moderate or severe. The organisms that were most carefully identified and included in the graphs are pneumococcus, beta hemolytic streptococcus, H. influenzae and hemolytic Staphylococcus aureus. Staphylococcus albus, alpha and gamma streptococci and diphtheroids were almost universally present in the nasopharynx.

Figure 3 (M. H.) shows the onset with slight malaise, sore throat, rhinorrhea, hoarseness and cough. On the second day the sore throat and rhinorrhea became moderately severe, and on the fifth day the malaise also increased. These symptoms continued through the seventh day but had disappeared by the tenth day except for a slight rhinorrhea. The first culture was not made until the fifth day; consequently the initial decrease in organisms does not show. This culture showed a heavy growth of Staphylococcus albus and other mouth organisms and a few colonies of hemolytic Staphylococcus aureus and Haemophilus influenzae. On the seventh day, when the cold was still active, the

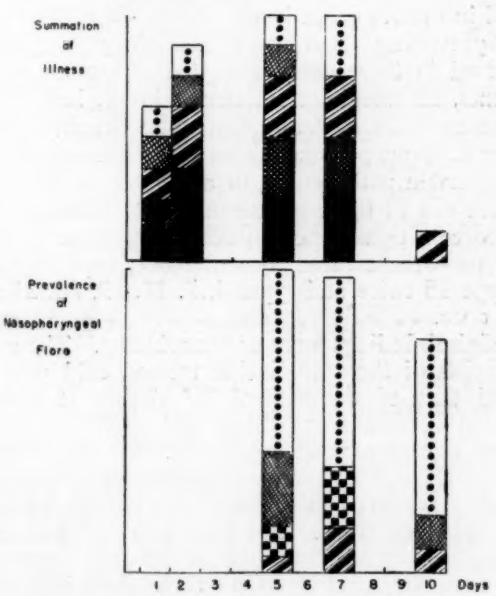

Fig. 3 (M. H.).—Control patient treated with milk sugar tablets. No change in pharyngeal flora; symptoms followed usual course.

culture continued to show a heavy growth with an increase in the number of colonies of Staphylococcus aureus and H. influenzae. On the tenth day, when the symptoms had subsided, the total number of organisms as well as the number of pathogens in the nasopharynx were decreasing.

TREATMENT WITH SULFADIAZINE

In the cases treated with sulfadiazine the most striking effect was the uniform reduction in the number and variety of organisms in the nasopharynx as measured by the serial nasopharyngeal cultures. Thirty-eight of the 48 cases studied showed a moderate or pronounced reduction in the total colony count. In some of these the effect was striking, showing on the plates a change from a heavy growth to a few scattered colonies. The total number of pathogens was also consistently reduced, but this seemed generally to be in proportion to the total reduction of organisms. Usually the pneumococcus, beta hemolytic streptococcus or other pathogen would not entirely disappear but would continue to show a few colonies and then return in larger numbers when the sulfadiazine was discontinued. The rapid return was pronounced in 6 of the 48 cases. In 10 instances no reduction in organisms was measured, but 5 of these showed a scant growth and no pathogens at the start, and the flora was held in check at that level.

Fig. 4.—Key of symbols for symptoms and nasopharyngeal flora.

The prevailing significant secondary organisms encountered in these cases were the pneumococcus in 20 patients, Haemophilus influenzae in 13, beta hemolytic streptococcus in 7 and hemolytic Staphylococcus aureus in 4. Nine persons in this entire group harbored no recognizable pathogens. In a number of instances more than one of these organisms were isolated. The pneumococcus types encountered were type 3 four times, type 6 three times, type 8 twice, type 18 three times, type 15 twice and types 4, 7, 11, 19, 20, 21 and 29 each once.

The clinical findings were not convincing. The average duration of the sulfadiazine treated cold was 8.1 days and that of the control 9.7 days. It can be appreciated that in a condition such as the common cold these figures are not significant. Of the 48 colds treated, 32 showed no recognizable secondary infection though they occurred in persons who usually suffered from complicated colds. Six persons developed sinusitis, bronchitis or both after the sulfadiazine treatment had been concluded. Five of the 6 had mild infections, but in 1 there was a moderately severe sinusitis and bronchitis (fig. 8), which lasted several days. Five patients had mild sinus and/or bronchial symptoms which developed during sulfonamide therapy. Five patients had irregular courses which could not be satisfactorily appraised. The patients were asked for their own opinions, and 34 expressed satisfaction with the therapy. Nine stated that they noticed no difference from previous colds, 1 was worse and 4 had no opinion to offer. These personal opinions were interesting, but we know how misleading such information can be.

Figures 5, 6, 7 and 8 show the course of symptoms and changes in nasopharyngeal flora following sulfadiazine 1 Gm. three times daily for four days. The cases that are included represent the various types of response observed in the study. In the first case (fig. 5, G. F.) the onset was with a slight soreness of the throat, malaise and moderate rhinorrhea and sinus congestion. On the fourth day of the cold, when sulfadiazine therapy was started, in addition to the symptoms of onset there was also a moderate cough, and the nasopharyngeal culture showed a heavy growth which was almost pure hemolytic staphylococcus aureus. Two days later (sixth day) the cold was much improved clinically but the nasopharyngeal culture still showed many colonies of hemolytic Staphylococcus aureus even though the blood sulfadiazine was 9.5 mg. per hundred cubic centimeters. Following this the symptoms disappeared almost completely; the nasopharyngeal culture showed a decided reduction in total organisms and almost complete disappearance of the hemolytic Staphylococcus aureus. This is the type of response that occurred in most of our cases.

Figure 6 (J. L.) shows a case that was not studied and treated until the tenth day of illness, when a very severe malaise, sore throat, rhinorrhea, sinus congestion and a moderate cough were present. The culture showed a heavy growth with many colonies of H. influenzae and a few colonies of hemolytic Staphylococcus aureus. The cold had progressed to the stage of secondary infection. Following the institution of sulfadiazine therapy the symptoms subsided and the nasopharyngeal culture cleared rapidly.

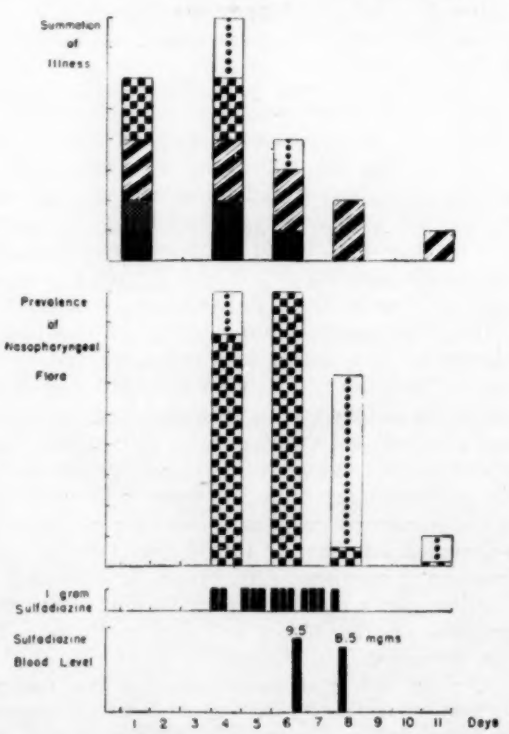

Fig. 5 (G. F.).—This patient shows a favorable clinical and bacteriologic response to sulfadiazine treatment.

Figure 7 (B. P.) again shows the course in a person treated by sulfadiazine 1.0 Gm. three times daily for four days. The onset this time was a slight sore throat

followed by severe rhinorrhea, moderate malaise and sinus symptoms. Treatment was instituted on the first day. The symptoms remained about the same for three days and then subsided slowly, disappearing except for a slight rhinorrhea on the seventh day. The

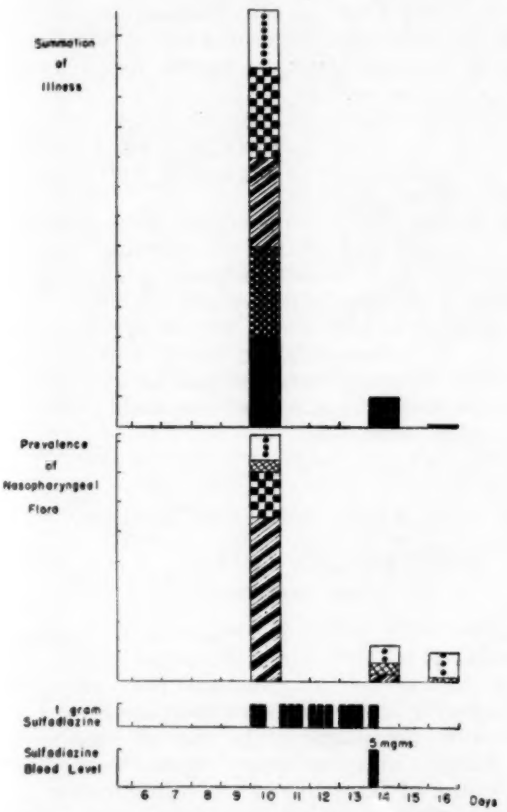
Summation of Illness
Prevalence of Nasopharyngeal Flora
1 gram Sulfadiazine
Sulfadiazine Blood Level
5 mgms
6 7 8 9 10 11 12 13 14 15 16 Days

Fig. 6 (J. L.).—Patient was treated late in his infection with sulfadiazine. Excellent clinical and bacteriologic response.

nasopharyngeal culture at the time therapy was instituted showed a few pneumococci and a very few colonies of H. influenzae; these disappeared after treatment was started and the total number of organisms was considerably decreased. When treatment was discontinued the number of organisms increased and a few pneumococci were again found, although there was no return of symptoms. This person ordinarily has a long course of sinusitis following a cold (two to four weeks).

Figure 8 (S. M.) is the graph of a case of acute coryza which started with an irritated throat followed by malaise, rhinorrhea and sinus congestion. Treatment was started on the second day, when the rhinorrhea was severe and there was also an irritative cough. The nasopharyngeal culture on this day showed a heavy growth with a few colonies each of beta hemolytic streptococcus, H. influenzae and hemolytic Staphylococcus aureus. With the four days of treatment the course was somewhat favorable, the nasopharyngeal culture showing only a few organisms, the hemolytic streptococcus and H. influenzae disappearing entirely, and the symptoms being slightly less in evidence. With cessation of sulfadiazine treatment, however, the hemolytic streptococcus returned and type 20 pneumococcus appeared in increasing numbers. At the same time the symptoms became aggravated and the patient developed a severe sinusitis and bronchitis. The suggestion in this case is that if therapy had been continued for a longer period the secondary infection would have been prevented.

COMMENT

This study affords evidence that the sulfonamides do not shorten or alter the course of the uncomplicated cold. Furthermore, no striking benefits from sulfadiazine therapy were observed in the complicated colds. There is evidence, however, largely from the bacteriologic findings, that in selected cases secondary infections may be prevented by the oral use of sulfadiazine.

Our bacteriologic study revealed a consistent reduction in total organisms and number of pathogens cultured from the mucous membrane of the upper respiratory tract both in healthy persons and during colds following 1.0 Gm. of sulfadiazine three times daily. Cultures were made from the nasopharynx, which has the advantage of being relatively free from nasal and mouth contaminants, but what is true for the nasopharynx must be true also for other parts of the upper respiratory tract such as the trachea and sinuses. Bordley and his collaborators [8] have reported similar bacteriologic findings following the local use of sulfadiazine, but their records indicate that satisfactory results are obtained only when the application is frequent enough to give an appreciable absorption. It would appear from our studies that the oral use of sulfadiazine is more dependable and simpler to administer than local application of the drug. Furthermore, the oral method is probably no more hazardous.

A very important factor in determining the value of sulfonamides in this field of therapy is the toxicity of the drug used. Sulfadiazine in the low dosage used in this experiment gives a satisfactory blood concentration but shows little clinical toxicity. The blood levels of sulfadiazine following the 3.0 Gm. daily dosage varied from 3.4 to 10.5 mg. per hundred cubic centimeters with an average of 6.9 per cent. No serious toxic reactions occurred during the study. There was no nausea or vomiting, but there were two mild renal reactions, one with slight flank pain and many crystals in the urine, and the other with mild pain in the lower part of the abdomen radiating to the scrotum, with a few red blood cells in the urine. One other patient showed a sudden drop in the white blood cells at the time the sulfadiazine therapy was completed, but a few days later the blood count was normal. The evidence from this study and other studies [15] is that toxic reactions on this dosage of sulfadiazine are rare but that

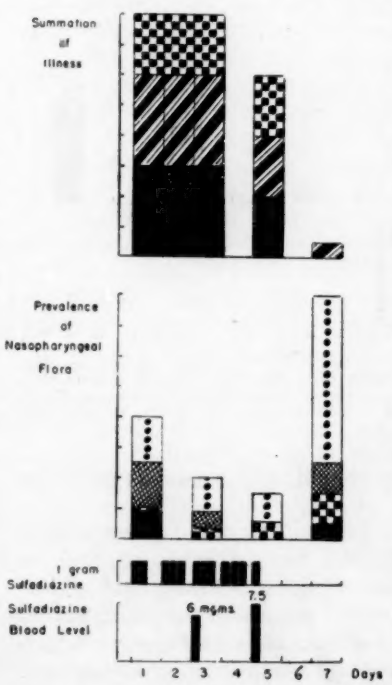

Fig. 7 (B. P.).—This patient shows excellent clinical and bacteriologic response to sulfadiazine but rapid reappearance of bacteria after discontinuance of the drug.

15. Plummer, Norman, and Wheeler, Charles: The Toxicity of Sulfadiazine: Observations on 1,357 Cases, Am. J. M. Sc., to be published.

they can occur and must be guarded against. There is also the possibility of minor chronic pathologic changes [16] occurring with sulfonamide therapy that may become significant following repeated courses of treatment. Finally there is the possibility of creating sulfonamide resistant organisms,[17] a condition which up to the present has had only a slight clinical significance in respiratory infections but which might be highly important if the sulfonamides are used in frequent short courses.

During the past few years a number of reports on acquired hypersensitivity to sulfonamide drugs have appeared in medical literature. The most recent and comprehensive of these reports is that of Longcope.[18] It would appear quite well established that a few individuals acquire hypersensitiveness to sulfonamide drugs and show their reaction by fever, skin rashes, nausea and vomiting and other manifestations. The occasional occurrence of this phenomenon presents another reason

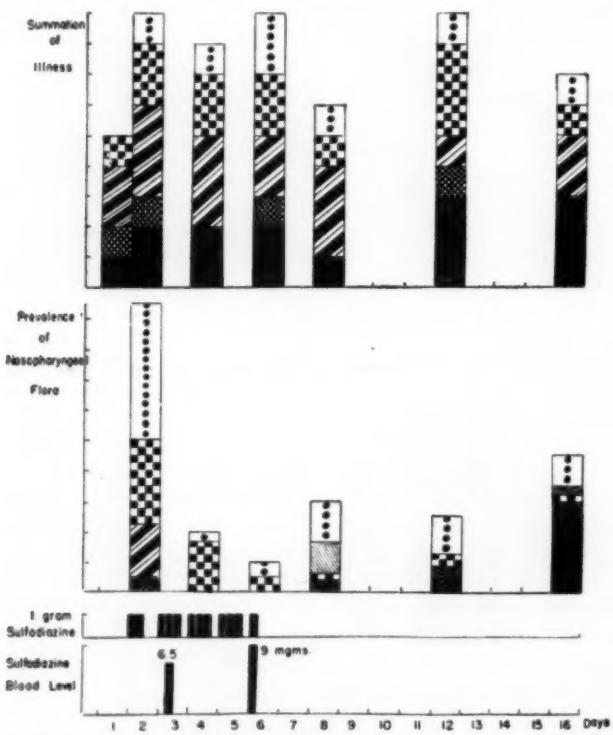
Summation of Illness
Prevalence of Nasopharyngeal Flora
1 gram Sulfadiazine
Sulfadiazine Blood Level
6.5
9 mgms.
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 Days

Fig. 8 (S. M.).—Acute coryza and sinusitis. Patient showed good bacteriologic response to sulfadiazine with only slight clinical improvement. With discontinuance of drug, pathogens again became numerous in the nasopharyngeal cultures, and patient developed a severe sinusitis and bronchitis.

why sulfonamide drugs should not be used as a routine in the common cold.

This report is only a preliminary one, but we present it chiefly because we believe that it offers a method for further study of the sulfonamides. On the basis of our experience we would restrict the use of the sulfonamides to a very few selected cases, such as those in which the history reveals an almost invariable and severe secondary infection following the cold. For example, there are the cases of asthmatic bronchitis, pneumonia secondary to bronchiectasis, repeated otitis media or recurrent severe sinusitis in which sulfonamide drugs under similar control should be thoroughly tested.

16. Merkel, W. C., and Crawford, R. C.: Pathologic Lesions Produced by Sulfathiazole: Report of Four Fatal Cases, J. A. M. A. **119**: 770 (July 4) 1942. Maisel, Bernard; McSwain, Barton, and Glenn, Frank: Effects of Administration of Sodium Sulfadiazine to Dogs, Arch. Surg. **46**: 326 (March) 1943.

17. Tillett, W. S.; Cambier, M. J., and Harris, W. H., Jr.: Sulfonamide-Fast Pneumococci: Clinical Report of Two Cases of Pneumonia Together with Experimental Studies on Effectiveness of Penicillin and Tyrothricin Against Sulfonamide Resistant Strains, J. Clin. Investigation **22**: 249 (March) 1943.

18. Longcope, W. T.: Serum Sickness and Analogous Reactions from Certain Drugs, Particularly the Sulfonamides, Medicine **22**: 251 (Sept.) 1943.

SUMMARY

1. Seventy-two colds in 66 different persons were followed clinically and bacteriologically; 48 received sulfadiazine 3.0 Gm. daily by mouth for four days, while 24 served as controls.

2. Following sulfadiazine, the nasopharyngeal flora as observed by serial cultures showed a uniform decrease in total number of organisms and a check in the growth of pathogens.

3. The clinical course of the treated colds showed no striking difference from that of the controls; however, there appeared to be some amelioration of symptoms due to control of secondary bacterial infection.

4. As a result of this study, we are opposed to the routine use of sulfonamides in the treatment of the common cold but would favor their use in a few selected cases as a protection against severe secondary infection.

33 East Sixty-First Street.

FEVER THERAPY IN OPHTHALMOLOGY

FREDERICK C. CORDES, M.D.
SAN FRANCISCO

One of the more recent developments in ophthalmic therapeutics has been the use of fever therapy for acute lesions of the eye and its adnexa. The pyrexia has been produced by three methods, the parenteral injection of nonspecific proteins, the use of malaria and physical means. There are many reports in the literature of the use of fever therapy in ophthalmology. It seems worth while to review the subject in an attempt to evaluate the various methods and to determine the safest and most efficacious one. It would appear that several of the methods have a more or less specific place in the ophthalmologist's armamentarium.

The use of fever therapy, according to Gifford,[1] began with observation of the beneficial effect of intercurrent infection with accompanying fever in various diseases. Only recently Reginis [2] and Delanoe and Sedan [3] observed definite improvement in trachoma following pneumonia, typhoid and malaria. Cases have also been observed in which the use of diphtheria antitoxin produced an apparently beneficial effect in diseases other than diphtheria. Such observations in the past formed the basis on which fever therapy developed.

The mechanism of the beneficial effect of this therapy has been described recently by Sanders.[4] He pointed out that in fever therapy a prompt effect is exercised on the autonomic nervous system; in the splanchnic area a vascular dilatation takes place, with contraction of the peripheral vessels causing a chill. This is soon followed by a capillary dilatation. With the rise of temperature there seems to be a general stimulation of cellular activity as shown by the changes in the blood. There is a short period of leukopenia followed

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1. Gifford, S. R.: A Handbook of Ocular Therapeutics, ed. 3, Philadelphia, Lea and Febiger, 1942, p. 140.

2. Reginis, Maria: The Effect of Febrile Disorders on Trachomatous Complications, Klinika Oczna. **14**: 688, 1936; abstr. Am. J. Ophth. **20**: 439 (April) 1937.

3. Delanoe and Sedan, Jean: Pyrexias and Trachoma, Rev. internat. du trachome **15**: 1 (Jan.) 1938.

4. Sanders, Theodore E.: Nonspecific Protein Therapy in Ocular Disease, J. Iowa M. Soc. **31**: 51 (Feb.) 1941.

by leukocytosis, with the white cell count from 12,000 to 15,000, in which polymorphonuclear cells predominate. There is definitely a rise of antibody content of the blood, from either increased formation or increased circulation of antibodies from the tissues. Peterson [5] was able to demonstrate that there is an increase in the blood content of proteolytic and lipolytic enzymes that break up the bacteria and their toxins into harmless products. This is accompanied by an increased cell permeability by which antibodies more readily penetrate the cells from the blood stream. Von Szily [6] found that one of the local reactions of the eye consists of an active hyperemia of the whole uveal tract accompanied by infiltration with lymphocytes. Brown [7] was able to show that the antibody content of the aqueous is increased. It seems probable according to Duke-Elder [8] that the main effect is a general one whereby the whole mechanism of immunity receives a stimulation that produces greater activity.

The role of the fever is still doubtful; it may be only an unimportant manifestation of the reaction or it may be the cause of the increase in cellular activity. The vasodilatation may also play an important part. Accord to Duggan [9] the effect of the bacteria and their toxins as well as the effect of other stimuli is the production of local ischemia with resultant pathologic changes. This newer conception of pathologic physiology is based on the work of Ricker,[10] who stated the belief that the underlying mechanism of both inflammatory conditions and hypertension is a neurovascular upset. In inflammatory conditions bacteria or other stimuli at first set up a vasoconstriction of all terminal vascular segments. The capillaries rapidly become fatigued and relax, producing a fatigue paresis. Thus a dilatation of the capillaries is present, associated with a sustained constriction of the arterioles, which results in a slowing of the blood stream in the capillary bed. With this dilatation the capillaries become more permeable, possibly owing to anoxemia or to opening up of stroma between the capillary endothelial cells. Thus it is apparent that, depending on the degree of slowing of the blood stream and therefore of capillary dilatation, there will be progressive degrees of exudate. In the milder cases this will consist only of plasma and fibrin, in the less mild it will contain white cells and in the severe cases it will contain red cells. There are many causes for the vasospasm, among them the toxin of bacteria. On this basis, increasing the oxygen available to the area by relief of vasospasm seems rational. Gifford and Marquardt [11] and others have called attention to the fact that typhoid vaccine therapy acts as a vasodilator. This explains the beneficial effect of vasodilators, such as sodium nitrite, when combined with typhoid vaccine in the treatment of an acute fundus lesion that appears to have an angiospastic basis. Thus it seems feasible to assume that, in addition to the changes caused in the blood picture, the vasodilator factor in fever therapy may be important.

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6. von Szily, A.: Experimental Investigation on the Effect of Foreign Protein Therapy in the Eye, Ztschr. f. Augenh. **71**: 196, 1930.
7. Brown, A. L.: Experimental Uveitis, Tr. Am. Ophth. Soc. **33**: 435, 1935.
8. Duke-Elder, W. S.: Text-Book of Ophthalmology, St. Louis, C. V. Mosby Company, 1941, vol. 3, p. 2215.
9. Duggan, W. F.: Choroidosis Centralis Serosa: Diagnosis, Pathologic Physiology and Therapy, Arch. Ophth. **27**: 123 (Jan.) 1942.
10. Ricker, C.: Sklerose und Hypertonie der innervierten Arterien, Berlin, Julius Springer, 1927; cited by Tucke, F. T., and Nicholls, J. V. V.: Am. J. Ophth. **21**: 395 (April) 1936.
11. Gifford, S. R., and Marquardt, G.: Central Angiospastic Retinopathy, Arch. Ophth. **21**: 211 (Feb.) 1939.

Both Gifford [1] and Sanders [4] have pointed out that because the fever is the most obvious and easily recorded manifestation it is the best criterion as to the severity of the reaction. While therapeutic results are usually in direct relation to the degree of reaction obtained, one must remember that at times there seems to be a beneficial effect without the production of appreciable fever.

Having discussed the changes that take place in the body during fever therapy, I shall consider the various forms of fever treatment used.

PARENTERAL INJECTION OF FOREIGN PROTEINS

Although foreign protein therapy has lost some of its former popularity, particularly since the advent of the sulfonamide drugs, it is still used for such conditions as typhoid, pneumonia, puerperal sepsis, arthritis, pelvic inflammation, syphilis of the central nervous system, other diseases of the central nervous system (such as multiple sclerosis), peptic ulcer, certain infections of the skin and some vascular conditions (such as thromboangiitis obliterans [4]).

Foreign protein therapy has been found useful in the treatment of many ophthalmic diseases, including acute conjunctivitis, gonorrheal ophthalmia, phlyctenular keratitis, interstitial keratitis, corneal abscess, corneal ulcer, acute iritis, chronic iritis, uveitis, postoperative iridocyclitis, disease resulting from a wound of the eyeball, scleritis and sympathetic ophthalmia. It has also been advocated for retinitis, choroiditis, optic neuritis and retrobulbar neuritis. Slavik [12] reported some improvement in retinitis pigmentosa after milk and typhoid therapy, while Kapuscinski [13] produced good results in herpes zoster and juvenile recurrent hemorrhage of the vitreous. Delanoe and Sedan [3] reported significant improvement in acute trachoma. Foreign protein should be given early in the disease, before permanent damage has been done to the tissues involved. There can be little doubt that foreign protein therapy is of greater value for inflammation in the uveal tract, particularly the anterior part, than in any other tissue of the body.

The ideal reaction according to Lewis [14] consists of a moderate chill with a temperature of about 103 F., which falls quickly and after twenty-four hours returns to normal. If it is desirable to continue the treatment another injection should not be given until the temperature returns to normal or its previous level. It is advisable to wait twenty-four hours at least, as not infrequently there is a secondary rise of temperature after twelve hours. Lewis said that the second dose should be given forty-eight hours after the initial dose and that too short an interval caused the death of 1 of his patients rather than large doses (50 million and then 100 million organisms). The output of urine should be checked after the injection. Hench [15] recommended that no food be taken two to four hours prior to the injection.

Severe reactions are rare but do occur. The size of the dose is not the only factor in their production, as they have been known to follow even very small doses.

Treatment of severe reactions has been discussed a number of times. Cold sponging and packing in iced

12. Slavik, B.: Stimulating Therapy in Pigmentary Degeneration of the Retina, Ceskoslav. Ofth. **3**: 1, 1937; abstr., Am. J. Ophth. **20**: 1172 (Nov.) 1937.
13. Kapuscinski, W. J.: Typhoid Vaccine in Ocular Therapeutics, Bull. Soc. franç. d'opht. **51**: 277, 1938.
14. Lewis, P. M.: Dangers from Nonspecific Protein Therapy, South. M. J. **34**: 51 (June) 1941.
15. Hench, P. S.: Usual and Unusual Reaction to Protein (Fever) Therapy, Arch. Int. Med. **49**: 1 (Jan.) 1932.

sheets is indicated. For anaphylactoid phenomena Hanzlik and Karsner [16] recommended the intravenous use of atropine and epinephrine. Howard [17] advised large doses of digitalis by hypodermic when a severe reaction occurs with signs of circulatory collapse. Hench [18] said that renal insufficiency and oliguria demand the administration of diuretics intravenously.

Foreign protein therapy is not without risk. There are definite contraindications to its use. Cecil [18] listed the more important ones: advanced arterial, renal or cardiac disease; allergic states or conditions of pronounced protein sensitivity, such as angioneurotic edema and giant urticaria; states of extreme exhaustion following prolonged illness; pulmonary tuberculosis, active or quiescent; hemorrhagic conditions, such as hemophilia and bleeding ulcers; chronic alcoholism, in which it may produce delirium tremens, and severe nervous sensibility, such as that seen in hyperthyroidism. Hench [18] added chronic infections of long duration with dissemination to several sites; the period within fourteen days after an operation, for hemorrhage has occurred occasionally when vaccine was given within ten days after tonsillectomy or a minor pelvic operation; pregnancy, for fear of inducing hemorrhage and uterine muscular contractions, and rheumatic fever with acute or decompensated carditis and diabetic acidosis. Raulston [19] stated that foreign protein therapy in the aged usually does not produce very favorable results.

In discussion of the various substances used to cause the reaction, the classification of Sanders [4] will be followed.

Native Proteins.—The successful and widespread use of foreign protein therapy in ophthalmology dates back to 1915, when it occurred to Schmidt [20] of Prague to use cow's milk to induce fever. There are earlier isolated instances of the use of foreign protein in the treatment of certain conditions, but Schmidt's work started this type of therapy in ophthalmology. His work was quickly followed by that of Saxl,[21] Muller and Thanner,[22] Purtscher [23] and many others. For a number of years this form of therapy was widely used. According to Muskat [24] its advantage is that milk is a universal product and constant in its chemical composition. He stated the belief that the good reaction was due to its complexity and the variety of enzymes in its cleavage products.

The usual method is to inject intramuscularly 8 to 12 cc. of fresh cow's milk (for patients of average weight) that has been sterilized by being boiled four minutes and has then been cooled. This period of boiling was chosen as being long enough to destroy bacterial contamination and yet not long enough to inactivate whatever might be the active component contained in milk. (In infants, for example in the treatment of ophthalmia neonatorum, 1 to 2 cc. is sufficient to produce a temperature of 100 to 103 F.) In most instances the injection is followed by a rise of body temperature, with chill and malaise, which usually subsides within eight hours. The temperature may rise to 100 to 103 F. or, in some instances, the injection may produce no reaction even though given in a similar manner and in a comparable case. Barkan and Nelson [25] were able to show that the shock-producing properties of milk depend in a large part on the bacterial count of the milk. El-Bakly [26] stated that the poorer grades of milk give better results because of the higher bacterial count. In the use of milk injections at the University of California, a reaction was not produced until milk was obtained from the corner grocer and incubated for twelve to twenty-four hours before injection. The hospital was supplied with certified milk, which has a low bacterial count (less than 10,000 per cubic centimeter).

While the literature contains many reports of successful reactions with milk, there were many failures because of this factor. In addition, the milk had to be boiled and cooled, which was an inconvenience. Hematoma and local abscesses were not infrequent. Because of the unreliablity of the reactions observed in this country and because of the complications mentioned, milk injections were not used as long or as extensively here as abroad. In discussing this subject with Pillat in Vienna in 1935 he stated that milk injections were not feasible in America, as the milk was too clean. As a result of these disadvantages other methods have in general come to replace the use of milk to induce fever in adults.

That milk was not entirely satisfactory is evidenced by the fact that many substitutes for milk were put on the market.

The caseins received a good deal of attention for a time. Wick [27] used yatren-casein, caseosan, alobintin, perprotasin and aolan and found that, while they were useful in treating acute ocular conditions, they were not as effective as milk. Triebenstein [28] also reported beneficial results with yatren-casein in some of the chronic inflammations of the eye but found milk injections were more effective. Gaston [29] found aolan much less effective than milk, while Jickeli [30] obtained good results from aolan. While there are numerous reports of the use of these caseins, they are as a rule not very encouraging.

Egg albumin was also used. The report of Frydman [31] is typical. He used cibalbumin, which contains 1 per cent egg albumin, and expressed the opinion that it produced mildly satisfactory results. He concluded that protein therapy by intramuscular injection of cibalbumin presents no danger to the general organism or the eye and that it was easily applicable to ambulatory patients.

Haass [32] pointed out that von Szily [6] demonstrated histologically that parenteral injection of nonspecific

16. Hanzlik, P. J., and Karsner, H. T.: Anaphylactoid Phenomena from Intravenous Administration of Various Colloids, Arsenicals and Other Agents, J. Pharmacol. & Exper. Therap. **14:** 379 (Jan.) 1920; A Comparison of the Prophylactic Effect of Atropine and Epinephrine in Anaphylactoid Shock and Anaphylactoid Phenomena from Various Colloids and Arsphenamine, ibid. **14:** 425 (Jan.) 1920.
17. Howard, H. J.: Intravenous Use of Typhoid-Paratyphoid Vaccine in Eye Diseases, Am. J. Ophth. **11:** 685 (Sept.) 1928.
18. Cecil, R. L.: Nonspecific Protein Therapy, J. A. M. A. **105:** 1846 (Dec. 7) 1935.
19. Raulston, B. O.: Foreign Protein Therapy, Am. J. Ophth. **14:** 149 (Feb.) 1931.
20. Schmidt, R.: Protein Therapy and the Parenteral Use of Milk, Med. Klin. **12:** 171 (Feb. 13) 1916.
21. Saxl, P.: The Care of Typhus by the Use of Milk Injections, Wien. klin. Wchnschr. **29:** 1043 (Aug. 17) 1916.
22. Muller, L., and Thanner, C.: Cure of Iritis and Other Diseases of the Eye with Albumin Injections, Med. Klin. **12:** 1120 (Oct. 22) 1916.
23. Purtscher, O.: Milk Injections in Eye Disease, Ztschr. f. Augenh. **43:** 100 (Jan.) 1920.
24. Muskat, I. I.: Milk Injections in Gonorrheal Ophthalmia, Am. J. Ophth. **2:** 539 (July) 1928.
25. Barkan, Otto, and Nelson, R. F.: The Active Agent in Milk Injection, Tr. Sect., Ophth. A. M. A., 1923, p. 131.
26. El-Bakly, M. A.: Milk Injections, Bull. Ophth. Soc. Egypt **26:** 179, 1933.
27. Wick, W.: Protein Therapy in Ophthalmology, Arch. Ophth. **118:** 221, 1927.
28. Triebenstein, Otto: Yatren in Treatment of Ocular Disease, München. med. Wchnschr. **70:** 770, 1923.
29. Gaston, J.: Milk Injections in Ophthalmia Cases, Am. J. Ophth. **9:** 111 (Feb.) 1926.
30. Jickeli, Carl: Further Experiences with Nonspecific Intracutaneous Aolan Therapy in Ocular Diseases, Klin. Monatsbl. f. Augenh. **80:** 221 (Feb.) 1928.
31. Frydman, R.: Protein Therapy in Ophthalmology, Rev. gén. d'opht. **42:** 85 (March) 1928.
32. Haass, F.: Remarks on Nonspecific Therapy, Especially with Protasin and Perprotasin, Ztschr. f. Augenh. **73:** 50 (Dec.) 1930.

protein results in an inflammatory reaction in the eye followed by a phase in which inflammation is retarded. He said that it would be desirable to find agents which would directly produce the second, or anti-inflammatory, stage, and he found protasin and perprotasin to be such agents.

Protein Split Products.—Protein split products, including peptone albumose and the proteoses, have all had their advocates but have never been used extensively. Nolf [33] injected 5.6 cc. of a 10 to 100 peptone solution into the vein and repeated the injection every hour. He obtained beneficial results in ocular complications occurring during typhoid, typhus and septicemia. Narog [34] found pepsin injected subconjunctivally useful in the treatment of trachomatous lesions of the eyelids and turbidity of the vitreous.

Tissue Extract.—Rinaldi,[35] injecting bovine uveal pigment in 10 cases of sympathetic ophthalmia, found slightly increased sensitivity. He said this treatment was distinctly beneficial but that the action was not like that of foreign protein, for it was only when all general and local reactions were avoided that the decided improvement resulted.

Serums.—As Clegg [36] has pointed out, various types of serum have been employed in the treatment of ocular lesions. They include the serums of Roux and Behring, Deutschman's yeast serum, auto serum, normal horse serum and antitoxin. Only the more frequently used ones will be discussed here.

As early as 1904 Darier,[37] noting the excellent results of diphtheria antitoxin, experimented with it in the treatment of conditions other than diphtheria. At about the same time Rohmer [38] used autoserum obtained by raising a blister in the scapular region, drawing off the serum and injecting it under the skin or subconjunctivally. Another method employed is to withdraw 5 to 10 cc. of blood from the patient's vein and either inject the whole blood intramuscularly immediately or allow the clot to separate and then inject the serum. The results have been claimed to be superior to those of other methods. Jacovides [39] used autoserum in 150 cases of corneal ulcer, with good results in 140. Wick [27] and others, in comparing the effects of autoserum with those of other proteins, found the results to be no different except that fever occurred less often with autoserum. Mata [40] reported 11 cases of tuberculous iridocyclitis in which he withdrew the aqueous and injected blood into the anterior chamber. He found that with this method the condition cleared more rapidly than in control eyes. As Gifford [1] pointed out, there seems to be no reason for ascribing to autoserum the remarkable advantages claimed by some authors, while the conditions of administering it make it much less convenient than milk or typhoid vaccine.

Antidiphtheria Serum: The use of antidiphtheria serum has been advocated by a number of authors. Key [41] used 2,400 to 3,200 units every two to three days in the treatment of corneal disease, including hypopyon keratitis and serpiginous ulcer, of infection of the anterior segment of the eye and of panophthalmitis. Verhoeff [42] reported some remarkable results in the treatment of sympathetic ophthalmia. According to the age of the patient, he used from 5,000 to 20,000 units daily for a week, eliminated the treatment the following week and then repeated it for two to three weeks.

Horse Serum: Scarlett [43] stated the belief that in diphtheria antitoxin it was the horse serum rather than the antitoxin that was the effective element. He used pure horse serum in the treatment of acute iritis and concluded that of the foreign proteins it gave the most definite reaction and also the greatest relief from symptoms.

The disadvantages of using pure horse serum or antitoxins are obvious. An intradermal test must be made for sensitivity to avoid the occurrence of dangerous or fatal anaphylactic shock. The test apparently is not infallible, as Liebman [44] reported anaphylactic shock following the use of antidiphtheria serum in a patient who had a negative intradermal reaction before injection of the serum. Most authorities agree that horse serum has the objection of sensitizing the subject and producing serum reactions. With repeated doses the nonspecific reactions may become more severe, even when the injections are made within the period usually allotted before sensitization will occur. Great caution should be exercised in its use, especially since there is no conclusive evidence that the temporary effects obtained are worth the dangers risked by its injection. The one disease for which its use may be justified is sympathetic ophthalmia, in which diphtheria antitoxin apparently is useful.

Vaccine.—While various vaccines have been employed, the use of typhoid vaccine intravenously is the method most widely advocated for fever therapy. The indications for its use are those given for other types of foreign protein fever therapy.

Typhoid vaccine was first used intravenously by Kraus and Mazza [45] in Argentina about 1912. It was first given intravenously as a nonspecific protein for fever therapy by Miller and Lusk [46] in the treatment of chronic infectious arthritis. It is employed for many diseases, particularly of the joints, skin and eyes. This discussion will be limited to its use in ophthalmology.

The preparation usually employed is the standard typhoid-paratyphoid A and B vaccine. The injection is given intravenously, and the dose varies from 5 million to 100 million organisms, depending on the individual ophthalmologist. Thirty million is the amount usually recommended as the initial dose. Sanders [4] recommended 50 million as the initial dose for men and 35 million for women. This is increased to 40 and then to 50, 60, 70 or 100 million, depending on the preceding reaction. The usual reaction consists of a chill, fever, mild headache, general malaise and mild gastrointestinal

33. Nolf, P.: Intravenous Injections of Peptone, Clin. Opht. **23:** 217, 1919.
34. Narog, F.: Experimental and Curative Applications of Pepsin in Eye Diseases, Am. J. Ophth. **9:** 746 (Oct.) 1926.
35. Rinaldi, S.: Clinical Research on the Antigenic Properties of Uveal Pigment, Ann. di ottal. e clin. ocul. **61:** 268 (April) 1933.
36. Clegg, J. Gray: Discussion of Etiology and Treatment of Hypopyon Ulcer, Tr. Ophth. Soc. U. Kingdom **47:** 24, 1923.
37. Darier, A.: Pros and Cons of Milk Injections, Clin. Opht. **25:** 607, 1921.
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41. Key, Ben Witt: Further Observations of Protein Injections in Severe Ocular Infection, Arch. Ophth. **51:** 471, 1922; Influence of Protein Therapy on Experimental Staphylococcic Infection of a Rabbit's Cornea, Am. J. Ophth. **9:** 351 (May) 1926.
42. Verhoeff, F. H.: An Effective Treatment for Sympathetic Uveitis, Tr. Am. Ophth. Soc. **24:** 173, 1926.
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46. Miller, J. L., and Lusk, F. B.: The Treatment of Arthritis by the Intravenous Injection of Foreign Protein, J. A. M. A. **66:** 1756 (June 3) 1916.

upset. The temperature varies a good deal with the individual patient and the vaccine used. Allen [47] found that the average temperature obtained after an average initial injection of 53 million organisms was 101.8 F. After the second injection, in which an average of 80 million organisms was used, the temperature averaged 102.7 F.

The use of typhoid vaccine is not entirely without danger, and, while they are rare, unusual reactions do occur. Hench [15] reported 3 deaths among 2,500 patients given 10,000 injections at the Mayo Clinic. Sudden death has also been reported by Russel,[48] Lemoine,[49] Patton [50] and others.

A focal reaction, or activation of the local lesion, immediately after an injection of foreign protein is a well recognized phenomenon but is usually transitory. It has been reported in the treatment of diseases of the eye by Benedict,[51] Tobias,[52] Lockhart [53] and others, but it is so rare in such treatment that it may be disregarded. The contraindications to fever therapy in general, previously listed, also apply here.

After the death in San Francisco of 2 young and apparently healthy persons who had received typhoid vaccine for ocular diseases in 1935, my co-workers and I at the University of California Hospital modified our dosage. According to the age, size and general condition of the patient, it is our routine to start intravenous injections of typhoid vaccine with a dose of 5 to 7 million killed organisms. This produces a moderate rise of temperature in one to two hours lasting two to four hours and producing relatively little discomfort. The temperature at times goes up to 103 F. but usually averages about 101 to 102 F. The following day the dose is increased to 7½ to 9 million organisms unless there has been a secondary rise of temperature, in which case the second dose is delayed twenty-four hours. On the third day 9 to 10 million organisms are given and on the fourth 12 to 15 million. Thus it is possible to produce fever and prolonged vasodilatation over a period of four days without any great discomfort to the patient. In a few instances when the patient does not respond to these doses the amount is increased to 25 million. It must be remembered that there is considerable variation in the potency of commercial vaccines regardless of their reported bacterial count and that doses must be varied accordingly.

Having used the smaller doses since 1935, we have found that the average temperature after the first injection has been 101.5 F., after the second 102.1 F., after the third 101.8 F. and after the fourth 101.4 F. These figures are almost identical with the temperatures observed by Allen,[47] who after an average dose of 53 million organisms found an average temperature of 101.8 F. and after a second average injection of 80 million organisms an average temperature of 102.2 F. In general we feel that vasodilatation is probably an important part of the beneficial effect derived from fever therapy, except in the treatment of syphilitic patients, and it is our opinion that the smaller doses of typhoid vaccine, which cause less severe systemic reactions, are as efficacious as the larger doses formerly employed and make prolonged vasodilatation possible. Hench [15] also favored the smaller doses and said that, "although large doses may be tolerated, small doses if accompanied by an adequate reaction seem preferable, since as beneficial results seem to follow the use of small doses as the large doses."

The method of dosage is as follows: We have used Cutter Laboratories (Berkeley, Calif.) typhoid vaccine, which contains 500 million bacilli per cubic centimeter. With a tuberculin syringe 0.1 cc. of this solution is drawn up; it is then diluted to 1.0 cc. with isotonic solution of sodium chloride or distilled water. With this solution 0.1 cc. contains 5 million, 0.15 cc. 7½ million, 0.24 cc. 12 million, 0.30 cc. 15 million organisms, and so on.

In addition to the usual conditions treated by fever therapy, we have found typhoid vaccine therapy valuable in the treatment of acute fundus lesions when a rapid prolonged vasodilatation is desirable. It has also been used in the treatment of acute fundus disease by Gifford and Marquardt [11] and Benedict and Rucker.[54] It can be combined with the use of sodium nitrite or some other form of vasodilator.

Of the means of inducing fever, typhoid vaccine is the most useful and the most widely employed in ophthalmology because of the consistent reaction and ease of use. In spite of occasional untoward reactions, there are acute ocular lesions that demand the risk because of the probable benefit and the hope of preservation of vision in what might otherwise be a hopeless situation.

Typhoid H Antigen.—The antigen in washed flagellums of typhoid bacilli, known as typhoid H antigen, induces a less violent reaction than typhoid vaccine and has been advocated as a substitute. The antigen is prepared by adding 0.1 to 0.2 per cent solution of formaldehyde or 0.5 per cent phenol to a broth culture or a saline solution suspension of a motile strain of Eberthella typhosa. Its uses and dosage are for all practical purposes identical with those of typhoid-paratyphoid vaccine. The principal advantage of typhoid H antigen is that it produces a satisfactory rise of temperature without a great deal of chill. It has been said that the chill phase of nonspecific foreign protein therapy is conducive to thrombosis and that its elimination adds materially to the safety of the method. This antigen has never obtained widespread popularity.

According to Klauder and Robertson,[55] after an intravenous injection the constitutional reaction is not pronounced, so that ambulant patients may be treated. They employed the method in 30 children with active interstitial keratitis attending the Wills Hospital, Philadelphia, the youngest patient being 6 years of age. They found that the chill appeared one hour after the injection, lasting usually about half an hour, and the temperature rose to 102 to 104 F., becoming normal in six to eight hours. Patients in the hospital as well as those attending the clinic were treated. No serious untoward reactions were produced. They found that different lots of typhoid H antigen varied in their ability to produce reactions and different patients varied in the degree of their reactions from the same lot of

47. Allen, Thomas D.: Typhoid Vaccine in Ophthalmology, Tr. Sect. Ophth., A. M. A., 1925, p. 135.
48. Russel, J. L.: Report of Two Deaths from the Third Inoculation with Typhoid-Paratyphoid Vaccine, Kentucky M. J. **22**: 378 (Oct.) 1924.
49. Lemoine, A. N., in discussion on Allen.[47]
50. Patton, J. M.: The Pros and Cons of Foreign Protein Injections in Affections of the Eye, J. Iowa M. Soc. **12**: 387 (Oct.) 1922.
51. Benedict, W.: Protein Therapy in Ophthalmology, Minnesota Med. **11**: 203 (April) 1928.
52. Tobias, G.: Focal Reaction in the Eye in Protein Therapy, Klin. Wchnschr. **1**: 55 (March 11) 1922.
53. Lockhart, R. J.: Coronary Thrombosis and Death After Typhoid-Paratyphoid Vaccine, Brit. J. Dermat. **51**: 318 (July) 1939.
54. Benedict, W. L., and Rucker, C. W.: Use of Foreign Proteins in the Treatment of Diseases of the Eye, New Orleans M. & S. J. **81**: 782 (May) 1929.
55. Klauder, J. V., and Robertson, H.: Fever Therapy in Interstitial Keratitis, Am. J. Ophth. **18**: 758 (Aug.) 1935.

vaccine. Sanders [4] stated that it can be used in the office and that it causes prompt rise of temperature but usually without chill. Brown [56] used typhoid H antigen preoperatively in all cases of cataract to prevent inflammation. From fifty to seventy-two hours before operation the patient was given intradermally 1 minim (0.06 cc.) of a solution of typhoid H antigen (25 million organisms per cubic centimeter). If there was no local reaction within twenty to thirty minutes, a solution containing 15 million organisms was injected intraveonusly. This was done at the office and the patient instructed to go home because a reaction might ensue in four to eight hours.

When an eye was perforated accidentally in any manner, typhoid H antigen was immediately given intravenously after a negative cutaneous reaction. If the wound was purely ocular, preference was given to the antigen rather than to antitetanus serum unless there was definite reason to fear exposure to tetanus.

In our limited experience with typhoid H antigen we found that the action and reaction were much like those of typhoid vaccine.

Mason,[57] in an endeavor to obtain good results from foreign protein without shock, used an antigen which contained Streptococcus haemolyticus with Staphylococcus aureus and Staphylococcus albus and which had a very low protein content and was nontoxic. He used it in 8 cases of uvetitis with excellent results. No patient showed shock or chill, and the temperatures did not register over 0.5 degree (F.) above normal. No further reports of this treatment have appeared.

Spirochetic vaccine of Hilgermann was used by Charamis [58] in the treatment of ocular syphilis. There were 3 patients with interstitial keratitis, 1 with oculomotor and facial nerve paralysis and 1 with choroiditis. Those with interstitial keratitis particularly were benefited. He said that vaccine therapy is valuable in slowly evolving cases and particularly as a complement to chemotherapy. Its use has been so limited that it does not require serious consideration.

Bacterial Extracts.—There are times when a milder fever therapy is desirable or when it is not practical to hospitalize the patient. Under these conditions Coley's mixed toxins [59] can be given in the clinic or office and the patient sent home. We have found this preparation to be a useful addition in fever therapy. Relatively little has been written regarding its use in ophthalmology aside from an article by Levine [60] in 1931. It is a mixture of toxins derived from killed cultures of Staphylococcus erysipelatis and Bacillus prodigiosus, which are grown separately, then mixed and finally diluted to a definite strength as determined by the percentage of proteins contained.

The adult dosage is 3 minims, with proportionately less for children. Deep intramuscular injections are given into the arm with the ordinary tuberculin syringe. Levine [60] found that in only 2 cases was it necessary to give 4 minims to obtain the desired reaction. The reaction sets in four to five hours after the injection, which allows the patient time to reach home before it starts. There is usually a chill that lasts fifteen to thirty minutes and is followed by a rise of temperature from 100 to 102 F. which may last ten or more hours. There is no headache or vomiting and very little discomfort. It is important, as Lewis [14] has pointed out, that the patient remain in bed until the reaction is entirely over. There may be some redness in the arm at the site of the injection, but it disappears quickly. Coley's mixed toxins have been found useful in the treatment of mild acute inflammation of the uveal tract, corneal ulcer and the milder postoperative iridocyclitis. It is well to remember this preparation as an inexpensive, easily administered means of fever therapy that can be used without hospitalization and produces a fair fever reaction.

Omnadin [61] consists of a mixture of protein substances obtained from nonpathogenic bacteria, various animal fats and lipoids derived from bile. It is given in 2 cc. doses intramuscularly daily or at times twice a day. It causes no temperature reaction and therefore strictly speaking does not belong in a discussion of fever therapy. As Sanders [4] has stated, it does, however, produce some leukocytosis and a rise in the antibody content of the blood. It causes no untoward reaction and has been found useful in those cases in which the physical condition does not warrant the severer types of foreign protein therapy, for example iridocyclitis following cataract extraction in older patients. Wick [27] found that, while it did not produce fever, as did milk, it did cause an improvement in the inflammatory process.

USE OF MALARIA

In 1918 Wagner-Jauregg [62] introduced malaria as a treatment for dementia paralytica, and, because of the remarkable results obtained, its use in the treatment of syphilitic conditions became rather widespread. Heat is a spirocheticide. The virulence of Treponema pallidum, studied in rabbits, was reduced when subjected to a temperature of 104 F. The thermal death point is slightly higher. This fact had led to use of the higher temperatures in fever therapy of syphilitic conditions.

In malaria fever therapy, Plasmodium vivax, the parasite of the benign tertian type, is used. A complete physical examination is necessary before the treatment is started to rule out the contraindications to fever therapy. It is not to be used for patients under 11 years of age, as typhoid therapy is as effective in the younger age group and malaria therapy is not well tolerated by children. According to Klauder and Robertson [55] Negroes are usually immune, so that it cannot be used in that race. To induce the fever 5 to 10 cc. of blood from a patient with malaria is withdrawn and injected into the vein of the recipient. With the onset of the fever the blood pressure should be taken twice daily and the blood count twice a week. If the systolic blood pressure drops below 90 between paroxysms and if the red cell count is below 2,000,000, the patient's condition is considered serious. In uncomplicated cases eight to ten chills are permitted before the malaria is terminated by giving quinine sulfate 0.09 Gm. three times a day for five to seven days. The local treatment to the eye is given as usual. During the treatment the patient is put on a high caloric diet and fluids are forced. The urinary output is watched, as oliguria necessitates suspension of the treatment. With this form of fever therapy the temperature will rise to 105 or 106 F.

56. Brown, Albert C.: Use of Typhoid H Antigen Before Intra-Ocular Operations, Arch. Ophth. **19:** 181 (Feb.) 1938.
57. Mason, R. E.: Bacterial Antigen in Uveitis, Am. J. Ophth. **11:** 702 (Sept.) 1929.
58. Charamis, J. S.: Vaccine Therapy of Ocular Syphilis by the Spirochetic Vaccine of Hilgermann, Arch. d'opht. **3:** 779, 1939.
59. Prepared by Parke, Davis & Company.
60. Levine, J.: Nonspecific Protein Therapy—Advantages of Coley's Mixed Toxins, Arch. Ophth. **6:** 75 (July) 1931.
61. Prepared by Winthrop Chemical Company, Inc.
62. Wagner-Jauregg, Julius: The Influence of Malaria on General Paralysis, Psychiat-neurol. Wchnschr. **20:** 132 (Aug.) 1918-1919.

Ambler and Van Cleve [63] stated the belief that this treatment is beneficial in interstitial keratitis. Clark [64] concluded that the malaria treatment may arrest syphilitic invasion of the optic nerves and preserve vision. The McIntyres [65] said that syphilitic optic nerve atrophy should be treated with malaria. In their opinion malaria has several practical advantages over heat therapy. It is less expensive and requires less time, less equipment and less technical assistance. The number of patients treated is not limited by the units. In addition, the biologic antagonism of malaria to syphilis is of longer duration and biochemically more far reaching than that exerted by heat alone. There are many other favorable reports in the literature.

In spite of the favorable reports there are serious inherent faults. The induced infection may produce great damage. There are always pronounced fatigue and wasting away as a result of the treatment. The mortality in different series varies from 1 to 10 per cent. The fever-producing properties are not constant, and 10 per cent of the injections are unsuccessful. The difficulty of maintaining properly attenuated strains of the virus also must be considered. As Hambresin [66] stated, it must be remembered that a patient inoculated with malaria can infect anopheles that would transmit the malaria. Lastly, malaria treatment requires from two to four weeks of hospitalization. From this it is apparent why even for syphilitic conditions malaria treatment has been rather generally discarded in favor of other types of fever therapy.

PHYSICAL MEANS

Several physical methods have been used to produce fever therapy. They have the advantage that the fever can be controlled as to time, amount and duration.

High Frequency Methods.—According to Coulter [67] the production of heat in the body tissues with high frequency currents insufficient in amount to harm or destroy tissues is called medical diathermy. There are three different methods of application.

Diathermy: This is usually construed to mean the use of the ordinary diathermy machine, which operates on a frequency of about 1,000 kilocycles (300 meters). It is applied by ordinary metallic electrodes held in contact with the body by a jacket or binder. The patient is covered with blankets or encased in an insulating bag. Neymann and Osborne [68] found it possible to induce fever with diathermy. Neymann and Koenig [69] reported that diathermy-induced fever produced a higher rate of remission in patients with dementia paralytica than was obtained in a comparable series of patients treated with malaria or rat bite fever. Other writers have given equally encouraging reports. The indications for the use of diathermy in ophthalmology are by no means well established. It has been used to give relief from pain in herpes zoster and in the treatment of corneal ulcer and a few other conditions. According to Gifford [1] one condition in which it has been successfully used is orbital cellulitis which does not localize well enough so that incision is effective. A large sheet of tin or aluminum is molded to cover the region, this being used as the active electrode. The larger the active electrode the less the heat that is generated at any one point; thus a large electrode eliminates heat that is "dangerous to the eye, provided that only 200 to 400 milliamperes be employed, and that the current be reduced whenever the heat becomes uncomfortable to the patient."

Radiothermy (Short Wave Therapy): The radiotherm is operated at about 10,000 kilocycles (30 meters) with tube oscillators. The patient is placed in a high frequency field between the two large plates of the radiotherm, without active contact, heat being produced by dielectric losses and induced currents. Bishop, Lehman and Warren [70] emphasized that in treating a patient by this method the moisture must be removed to prevent burns. They employed a cabinet in which lamps maintained the temperature after the current was turned off. With this apparatus, according to Hambresin,[66] one produces a temperature of 105 F. in a patient weighing 70 Kg. in half an hour. After this temperature is reached it is maintained for four hours. This treatment demands rigorous supervision by a nurse-technician during the application and the repose period that follows. According to Bierman [71] there is evidence that short wave therapy does have some bacteriostatic effect in various tissue infections. In addition to elevation of the temperature the biologic reaction of tissues is important. This includes hyperemia, with its greater blood and lymph flow, together with changes in local metabolism and local immunity. One of the real dangers of this method of treatment is burns of the skin. Its use has been reported in the treatment of chronic uveitis, vascular fundus disease, acute progressive infection and syphilitic optic nerve atrophy, but observations of treatment of ocular disorders are rare. There is no record of damage to the eye from the local use of short wave therapy. Short wave is an effective agent for creating heat within the eye. The work done in this field is recent and the number of cases too few to permit a conclusive statement as to the value of short wave therapy.

Inductothermy: In this method of fever therapy an electromagnetic field is produced with the patient acting as resistance. Heat is therefore induced internally. The technic, according to Weeks and Morris,[72] is simple. The patient can be treated in bed with a canvas support replacing the springs.

The induction cable is laid in a loop on the bed. Padding is placed between and around the loop to provide a level surface. The patient is placed in a water-proof canvas bag with a wood cradle inserted between patient and bag so as to permit a certain degree of mobility.

The pulse rate, respiratory rate and rectal temperature are recorded every five minutes.

In general, old age, organic lesions of the cardiovascular system, nephritis, anemia and pronounced emotional and nervous instability are considered contraindications for this type of therapy.

A temperature of 106 F. is produced and maintained for from four to six hours and at times for a total of twelve hours.

63. Ambler, J. V., and Van Cleve, J. Y.: Malarial Therapy in Syphilitic Interstitial Keratitis, J. A. M. A. **102**: 1553 (May 12) 1934.
64. Clark, C. P.: Effect of Malaria on Certain Syphilitic Conditions of the Eye, Tr. Am. Ophth. Soc. **32**: 453, 1934.
65. McIntyre, H. D., and McIntyre, A. P.: Fourteen Years' Experience with Malarial Treatment of Paresis and Other Forms of Neurosyphilis, J. Med. **19**: 440 (Nov.) 1938.
66. Hambresin, L.: Pyretotherapy in Ophthalmology, Arch. Ophth. **19**: 497 (April) 1938.
67. Coulter, John S.: Medical Diathermy, J. A. M. A. **106**: 209 (Jan. 18) 1936.
68. Neymann, C. A., and Osborne, S. L.: Artificial Fever Produced by High Frequency Current: Preliminary Report, Illinois M. J. **56**: 199 (Sept.) 1929.
69. Neymann, C. A., and Koenig, M. H.: Treatment of Dementia Paralytica: Comparative Therapeutic Results with Malaria, Rat Bite Fever and Diathermy, J. A. M. A. **96**: 1858 (May 30) 1931.
70. Bishop, F. W.; Lehman, Emmy, and Warren, S. L.: Comparison of Three Electric Methods of Producing Artificial Hyperthermia, J. A. M. A. **104**: 910 (March 16) 1935.
71. Bierman, William: Medical Applications of the Short Wave Current, ed. 2, Baltimore, Williams & Wilkins Company, 1942.
72. Weeks, Webb W., and Morris, S. A.: Induced Hyperpyrexia in Ophthalmology, Am. J. Ophth. **21**: 664 (June) 1938.

Weeks and Morris [72] from their observations concluded that the therapy appears to be valuable in the ocular complications of gonorrhea, in iritis, in superficial punctate keratitis and in scleritis. They found it of little value in trachoma, syphilitic uveitis and interstitial keratitis.

Kettering Hypertherm.—A wide variety of other physical means has been employed to produce hyperpyrexia, including hot baths, hot air, electric blankets and various forms of radiant energy, such as electric lamps in a cabinet. Use of a radiant energy cabinet is the easiest and most convenient method. There is no apparent difference in the clinical effects from various types. Of the air conditioned cabinets, the Kettering hypertherm is the best known and most widely used.

The following description is from Kendall, Webb and Simpson's [73] article: The Kettering hypertherm is an insulated cabinet in which the nude patient lies with the head extending outside the cabinet. There is sponge rubber insulation around the neck where it projects through the cabinet. The patient lies on an air mattress supported by a boxlike bed which is rolled in and out of the cabinet at will. In the rear of the apparatus is a small insulated fireproof compartment for the air conditioning apparatus. The temperature of the air, recorded on a dry bulb thermometer, is controlled by a thermostat. The humidity is controlled by a "humidistat." The velocity of air within the cabinet is controlled by fixed speed blowers.

Induction of fever is accomplished by the circulation of heated air from air conditioning apparatus and from the heated mattress, together with the prevention of radiation and evaporation from the body by the cabinet.

With this method a rectal temperature of 105 F. or over is usually reached in from forty to sixty minutes. By adjusting the air temperature and humidity one may maintain the body temperature at the desired level. At the completion of the treatment defervescence is produced by streams of cooler air. The body temperature usually returns to normal in from thirty to forty minutes.

Culler and Simpson [74] regarded advanced age, myocardial insufficiency and aortic aneurysm as contraindications. McGavic [75] added to these renal disease, active tuberculosis and diabetes if not controlled. Controlled diabetes is not considered as a contraindication.[76]

Constant observation by an especially trained physician and nurse-technician is regarded as an essential feature of the fever therapy. During the treatment water and cool 0.6 per cent saline solution are given by mouth to maintain the chloride balance. Mental and physical preparation for the treatment is also carried out in detail. Culler and Simpson [74] gave most of their patients ten weekly treatments of five hours each at a rectal temperature of from 105 to 106 F.

Culler and Simpson treated 58 patients with ocular syphilis with approximately fifty hours of fever. Interstitial keratitis seemed to be definitely benefited. In each of 10 cases of exudative uveitis prompt clinical improvement became apparent. Improvement was noted in optic neuritis and neuroretinitis, active choroiditis and optic nerve atrophy. McGavic [75] found the treatment most efficacious in gonorrheal conjunctivitis and syphilitic iridocyclitis. Hasler and Spekter [77] found it effective likewise in gonorrheal ophthalmia. Whitney [78] reported beneficial results in corneal ulcer. Prati [79] reported a case of syphilitic optic nerve atrophy which improved under pyretotherapy. There are similar reports from other authors. Krusen and Elkins [80] emphasized that the combination of fever therapy and administration of the sulfonamide compounds is much more effective than use of the sulfonamide compounds alone. The principal value of this form of therapy seems to be in the treatment of ocular syphilis. This is understandable when one remembers that the spirochete is susceptible to the higher degrees of fever.

The disadvantages and advantages of the Kettering hypertherm have been given by McGavic.[75]

He observed the following disadvantages: The treatment is a very strenuous one attended by fear, fatigue and some danger of collapse and heat stroke. Constant nursing care is absolutely necessary, one nurse being required for each patient. The machine is rather expensive, and the cost of operation is rather high. The machines are accessible to only a limited number of practicing physicians.

The Kettering hypertherm offers the following advantages: High temperatures are readily attained and maintained when desired and the temperature is easily controlled. No new disease is added, as in malaria therapy. Hospitalization is often not necessary, the patient being treated as an outpatient or at most kept overnight. The action is rapid and the therapy can be given three times a week for acute processes and weekly for the more chronic. Any other treatment, local or general, directed toward ocular or systemic disease may be given concurrently. Antisyphilitic chemotherapy is considered more effective when combined with fever therapy. Typhoid vaccine and other nonspecific proteins can be injected between fever treatments.

More investigation is necessary before definite conclusions can be drawn as to the proper place of air conditioned fever cabinets in artificial hyperpyrexia.

CONCLUSIONS

From a review of the subject of fever therapy in ophthalmology it would appear that certain conclusions are justified.

1. Milk injections are of particular value in the treatment of infants, especially those with ophthalmia neonatorum, since the injections usually cause a fever of 100 to 103 F. This applies even though the sulfonamide compounds are used, as it has been shown that their action is greater in the presence of elevated temperature.

2. Diphtheria antitoxin has many disadvantages, but its use in the treatment of sympathetic ophthalmia seems justified.

3. Typhoid vaccine is the most useful and generally used agent to produce fever for the treatment of acute lesions of the eye and its adnexa. On the theory that vasodilatation may be a factor in the beneficial results, smaller doses administered over a longer period seem as effective and cause less shock and discomfort. The temperature reaction in a series of cases in which

73. Kendell, H. W.; Webb, W. W., and Simpson, W. M.: Artificial Fever Therapy of Gonorrheal Arthritis, Am. J. Surg. **29**: 428 (Sept.) 1935.
74. Culler, A. M., and Simpson, W. M.: Artificial Fever Therapy in Cases of Ocular Syphilis, Arch. Ophth. **15**: 624 (April) 1936.
75. McGavic, J. S.: Fever Therapy in Ocular Diseases, Arch. Ophth. **19**: 769 (May) 1938.
76. Desjardins, A.; Stuhler, L. G., and Popp, W. C.: Fever Therapy for Gonococcic Infection, J. A. M. A. **104**: 873 (March 16) 1935.
77. Hasler, W. T., and Spekter, Louis: Artificial Fever in the Treatment of Gonorrheal Ophthalmia, J. A. M. A. **107**: 102 (July 11) 1936.
78. Whitney, E. L.: Artificial Therapy in Treatment of Corneal Ulcer and Acute Iritis, J. A. M. A. **104**: 1794 (May 18), 1935.
79. Prati, L.: A Case of Luetic Optic Atrophy Treated with Pyretotherapy, Riv. oto-neuro-oftal. **12**: 288 (March) 1935.
80. Krusen, F. H., and Elkins, E. C.: Investigations in Fever Therapy, Arch. Phys. Therapy **20**: 77 (Feb.) 1939.

smaller doses were used corresponded closely to that obtained in a series in which the average first dose was 53 million and the average second dose was 80 million organisms. There are certain rather definite contraindications to its use.

4. When a milder fever is indicated or the patient's condition does not warrant typhoid vaccine, the use of Coley's mixed toxins is advisable. This preparation has the advantage that hospitalization is not necessary.

5. Omnadin has a place in the treatment of acute conditions when shock therapy must be avoided but leukocytosis and a rise in the antibody content of the blood are desirable. It is not as effective as typhoid vaccine or other forms of foreign protein but can be used when they are contraindicated.

6. The use of malaria is not justified for ophthalmic diseases.

7. Hyperpyrexia induced by high frequency methods is still in the experimental stage. Further observations are necessary to disclose the conditions in which it is most effective and to establish the dosage compatible with safety.

8. Of the various physical means used to produce hyperpyrexia, air conditioned cabinets of the Kettering hypertherm type are best. Production of fever by physical means is most efficacious in the treatment of gonorrheal conjunctivitis and syphilitic keratitis and iridocyclitis. It is particularly useful in the treatment of syphilitic diseases of the eye. Because of the severity of the treatment it should be used only in those cases in which other forms of therapy are unsatisfactory.

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ABSTRACT OF DISCUSSION

DR. EVERETT L. GOAR, Houston, Texas: In recent years I have confined my efforts in fever therapy to the use of typhoid H antigen given intravenously. I prefer the H antigen because it produces the same therapeutic results as the mixed vaccine, with less discomfort. It seldom causes a chill unless given in a large dose, and the chill is not an essential part of the reaction. The initial dose should vary with the age, size and physical condition of the patient and with the severity of the infection. It is well to start with a small dose—about ten million, unless the infection is a virulent one. Formerly I always hospitalized patients before the initial doses, but with a scarcity of hospital beds I now make an intradermal test and, if this is negative, give them an intravenous injection and let them go home with instructions to keep quiet and to keep a temperature chart. They return in forty-eight hours and the dose is increased. This is the best treatment for anterior uveitis which is not tuberculous or syphilitic in origin. It is much less efficient in posterior uveitis and I am not at all sure of its value in optic neuritis. The only two possible dangers of this type of therapy are (1) anaphylaxis and (2) overdosage or too frequent dosage. Most of the severe reactions are due to the latter. Anaphylaxis may be avoided by preliminary intradermal testing, and untoward reactions may be prevented by small initial doses and by waiting long enough for a secondary rise in temperature to subside before repeating the dose. I have given hundreds of doses to all ages of people, many of them old and in poor physical condition, following these simple methods, and have never seen an alarming reaction.

DR. SANFORD R. GIFFORD, Chicago: In view of the proved efficacy of the sulfonamide drugs in gonococcic infections, the use of foreign protein injections are quite possibly unnecessary in gonococcic conjunctivitis of the newborn. It would be interesting to see a carefully controlled series of patients with gonococcic conjunctivitis treated with sulfathiazole plus fever. Most ophthalmologists will prefer the use of typhoid vaccine for adults or of milk for babies. In acute iridocyclitis the situation is somewhat different. In the absence of syphilis the evidence of a bacterial agent is often wanting, while exact bacteriologic diagnosis is usually impossible. Most of us at Northwestern University still feel that foreign protein therapy, with or without the sulfonamide drugs, is of considerable value. We employ typhoid vaccine by vein and still find that the dosage of Allen, from 30 to 80 million organisms, usually produces the desired reactions. It is interesting that Dr. Cordes was able to produce such definite reactions with much smaller doses. Fever in our patients is probably, on the average, somewhat higher than in his series, often rising to 103 F. and occasionally to 104 F., but it is by no means certain that the results are superior to his. The preparation of vaccine employed certainly plays a part. The prepared proteins with which fever is not produced would seem to have little to recommend them. In syphilitic iridocyclitis the results of specific therapy are usually so good that it would seem unnecessary to submit these patients to hyperpyrexia. In nonspecific chorioretinitis the case for fever therapy is about the same as in iridocyclitis, except that the results are less dramatic and more difficult to evaluate. The same may be said of fever therapy in optic neuritis and retrobulbar neuritis. Here the evidence for any therapy is vitiated by the tendency to spontaneous recovery in most cases, at least during a first attack. We still employ typhoid vaccine along with large doses of thiamine hydrochloride. Future attacks may be expected in many cases, and the later signs of multiple sclerosis can hardly be prevented by this treatment. In serpent ulcer there still seems to be a place for fever therapy. As Brown has shown, intravenous typhoid vaccine does increase the concentration of antibodies in the aqueous and presumably in the cornea. With sulfonamide therapy results are undoubtedly better than with fever therapy and local treatment alone. With the use of early keratotomy I have obtained the impression that fever therapy is often unnecessary. Hyperpyrexia by physical means has a definite place in the treatment of those forms of syphilis which are resistant to chemotherapy alone. These are practically limited to interstitial keratitis and optic atrophy. In optic atrophy our experience has been small. In these two exceedingly serious syphilitic conditions it would certainly seem that fever therapy is justified in spite of its admitted inconveniences and expense. The hypertherm would seem, for many reasons, superior to malarial inoculations.

DR. GRADY CLAY, Atlanta, Ga.: My earliest experience was with the use of boiled milk, using it for a child who was admitted to the hospital with a perforated injury to the cornea of a day's duration, and the eye then showed a beginning panophthalmitis. With daily injections of milk the eye promptly cleared. Such a spectacular cure in a heretofore hopeless situation made me an early stanch advocate of such a therapeutic agency. In our clinic at Emory University we have continued to use boiled milk because we have had good results and there is no expenses connected with its use. In private practice I now use subcutaneous injections of proteolac and intravenous injections of typhoid vaccine. In every case in which intraocular surgery is done I use the intramuscular injection of foreign protein. I use it routinely in all infected bacterial corneal ulcers, many of the interstitial keratitis cases, and all cases or intraocular inflammations such as iritis, iridocyclitis, uveitis, acute exudative choroiditis and severe types of optic neuritis, especially those associated with encephalitis. I think it best to admit the service patients to the hospital and use intravenous typhoid vaccine as outlined by Dr. Cordes. In using typhoid one should never overlook its dangers, and for that reason it should not be given at the office or at home. The various photographs shown are too numerous to publish but show clearly the different stages of angiospasms, arteriolar sclerosis and the other hypertensive stage discussed in this paper.

DR. FREDERICK C. CORDES, San Francisco: Typhoid H antigen is often regarded as being without danger, owing to the fact that it can be given in the office. Because of this two points brought out by Dr. Goar bear emphasis, namely the possible danger of anaphylaxis and overdosage. He doesn't give his method of doing the intradermal test but I imagine it coincides with that of Brown, who advocates the intradermal injection of 1 minim (0.06 cc.) of a solution of H antigen (25 million organisms per cubic centimeter). If no local reaction takes place within twenty to thirty minutes, he feels that

the patient is not sensitive. I agree with Dr. Gifford that the sulfonamide drugs are so effective in ophthalmia neonatorum that milk injections are probably unnecessary. In the use of fever therapy it is well to remember that a patient who has had typhoid may not react to typhoid vaccine. In such a case seen recently hyperpyrexia by physical means was found useful in helping to control a severe uveitis. I agree with Dr. Clay that typhoid vaccine should not be given at the office or at home because of the possible reactions that may at times be encountered in its use.

PLASTER OF PARIS CASTS

AN EXPERIMENTAL AND CLINICAL ANALYSIS

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Wars impel us to improve our technic of applying casts. It was to enable him to use plaster of paris conveniently on the battlefield that led A. Matthysen, a medical officer in the Dutch army, to invent and describe the plaster of paris bandage in 1852. He employed a coarse cotton bandage and manually rubbed plaster of paris into it, very much as we do today. This was a great improvement over the method of mixing the plaster of paris with water and pouring it into a box enclosing an extremity, a method that had been in use for the preceding half century.

In every war since the Crimean (1854-1856), plaster of paris has been extensively used; but in this present conflict there will be more plaster of paris used than in all previous wars combined. For many wounds, encasement in plaster of paris represents the best method of treatment.

During the past 2,500 years, man's search for the ideal cast medium has never ceased. A multitude of materials have been utilized, many of which have been recommended by their creators as superior to plaster of paris. However, nothing now known threatens the position of plaster of paris as the most universally acceptable cast material we possess.

Through the decades of the past 150 years the pendulum of popularity has swung to and away from the use of plaster of paris many times. Critics of its use have had their day only to see plaster encasement again rise as a dominant method of treatment. Numerous errors in the use of this method of treatment have been corrected only to be forgotten and later rediscovered and recorrected.

From the standpoint of the plaster itself, so much has been accomplished by manufacturers that most plaster of paris and crinoline now on the market is consistently good. Far more of the unsatisfactory casts examined were the result of poor technic of application than the result of defective plaster of paris and crinoline. Of course the bandages must be well made; if they are too tightly rolled they soak incompletely and have dry spots; if too loosely rolled they telescope. Since there are comprehensive treatises available on the preparation of plaster bandages,[1] this paper will deal principally with the technic of application. Each detail in the technic of applying plaster of paris casts and splints will be analyzed in terms of its capacity to weaken or strengthen the cast. Several important points herein advised are based on the results of experiments.

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Experiments herein reported were made possible through funds and facilities provided by the Douglas Aircraft Company of Santa Monica, Calif. Engineers from the stress group, Mr. Charles Strang, chief stress engineer, Mr. Louis Abraham and Mr. George Halgedahl did the calculations and assisted in the experiments.

1. McLin, W. C.: Hospital Made Plaster Bandages, Modern Hosp. 55: 51 (Aug.) 1940.

THE SETTING PROCESS

Since an understanding of the setting process and chemistry of plaster of paris is indispensable to good plaster technic, a brief description is in order. Plaster of paris (anhydrous calcium sulfate) is mined from underground deposits where it exists as a solid crystalline material known as gypsum (hydrated calcium sulfate). In its natural state gypsum is mixed with impurities such as silicates, iron and carbonates. To refine gypsum and transform it to plaster of paris, it is heated to around 120 C. to drive off most of the water of crystallization, $2(CaSO_4 \cdot 2H_2O) \rightleftarrows (CaSO_4)_2 \cdot H_2O + 3H_2O$. Removal of nearly 100 per cent of the impurities and the addition of a proper accelerator to reduce the length of the setting time completes the preparation of orthopedic plaster of paris.

When plaster of paris is soaked in water it promptly takes up water and goes back into a solid crystalline state. Viewed microscopically, crystals rapidly form and interlock. It is the tight interlocking of the crystals that gives the plaster much of its ultimate strength. But this important phenomenon will not properly occur unless the plaster is undisturbed during most of the setting process. This can be observed both microscopically and clinically. No single point in the application of plaster of paris is more important or deserves more emphasis than the protection of the plaster from movement during that decisive period when the plaster is going from a fluid to a solid state. In appreciating the need for immobilization during this initial setting period, it is helpful to view the crystallization process microscopically. Figure 1 is a photomicrograph of plaster of paris in powdered form ready for use. In figure 2, water has been added and the crystals have been allowed to form and set undisturbed. Figure 3 indicates the pattern of a field of crystals that were disturbed by a moderate amount of movement during the period when the powder was taking up water of crystallization and consolidating. A comparison of figure 2 and figure 3 reveals two important differences. First, the crystals in figure 2 are closely interlocked, as compared to a loose interlocking in figure 3. Second, the crystals in figure 2 are long and thin, whereas those in figure 3 by comparison are short and thick. For maximum strength in a plaster of paris cast or splint, everything possible must be done to encourage the proper formation and interlocking of the crystals.

It is extremely important that physicians and technicians who apply plaster of paris casts and splints become familiar with what may well be termed the "critical point." The "critical point" may be defined as that point in the setting process when immobility of the plaster becomes imperative if the cast or splint is to set properly and become rigid. Molding the cast, changing the position of a joint or fracture fragment should be carefully avoided subsequent to the "critical point." Recognizing the "critical point" requires experience and varies with different brands of plaster. In general it is reached when the plaster has attained the consistency of thick cream. Once the plaster loses its wet glistening appearance or becomes grainy, the "critical point" is past. When in doubt, errors should be made on the side of safety.

When water is added to plaster of paris powder, the crystals that form are about one-fifth water of crystallization. After the plaster sets, all water in excess of that

required for the crystallization process disappears by evaporating from the surface. In thin casts this may take place in a matter of hours, but in thick casts it is usually a matter of days. The rate with which evaporation occurs depends on the air, its humidity, its temperature and its circulation around the cast. Casts may appear dry on their surface and contain considerable water in their deeper layers. The experimental casts had to be dried for seven days to assure that virtually all free water in them had evaporated. In some of the first tests, casts one or two days old were used and when compressed only a few hundred pounds in the Southwark machine they would not crack or break but would simply flow and collapse, and drops of water would appear on the surface. There was a steady increase in strength of the casts for the first three to six days as more and more of the excessive water came to the surface and evaporated.

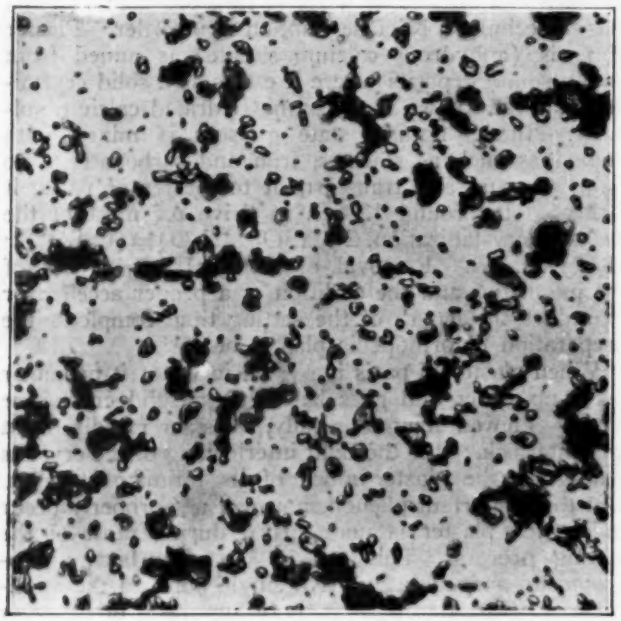


Fig. 1.—Plaster of paris in powdered form ready for use (× 300).

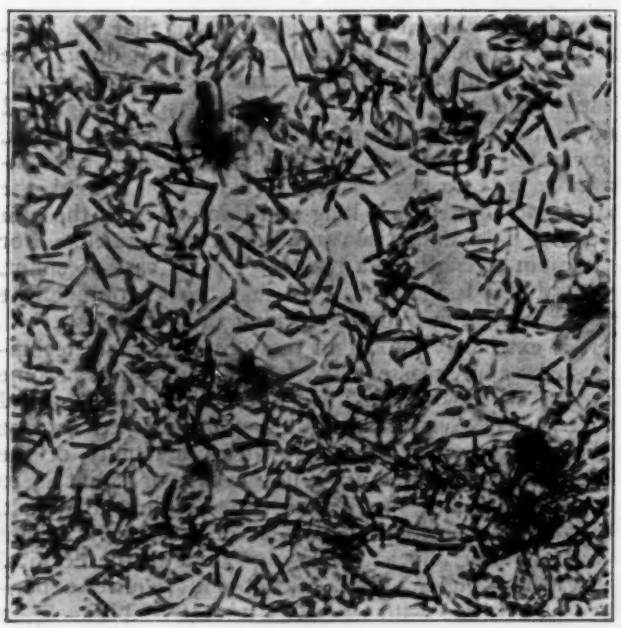


Fig. 2.—Plaster of paris crystals (× 300) which were not disturbed during the setting process. Note the compact interlocking of the crystals.

It is a mistake to assume that a cast attains its full strength the first day after application. In wet, humid climates a heavy cast may remain weak and wet for many days. Under such circumstances a cast drier and free circulation of air around the cast are indispensable. When evaporation from the surface of a green cast is prevented by heavy blankets or humid air, the cast will frequently become rubbery and useless.

EXPERIMENTAL PLAN AND SETUP

Plaster of paris cylinders were made on three piece wooden forms. Three piece forms were made so that a wedge shaped center section could be drawn out after the cast had set, thus making it easy to withdraw the two lateral parts of the form. It is far simpler to remove a three piece form from a plaster of paris cylinder than it is to remove a form made in one piece. Two types of plaster cylinders were made: one for a compression test setup and the other for beam-test experiments. Compression-test casts were made 12 inches long, beam-test casts 26 inches long, and all casts were 5 inches in diameter. Plaster bandages 4 inches wide and 5 yards long were used, and most of the casts were six layers thick.

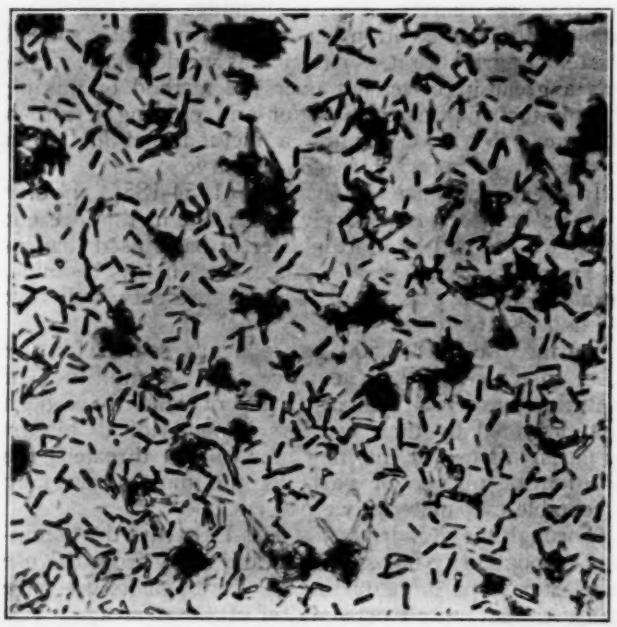


Fig. 3.—Plaster of paris crystals (× 300) that were disturbed by motion after the "critical point" in the setting process. Note the sparse interlocking of the crystals.

Plaster bandages and splints were kept uniform in size and in plaster content. For further uniformity, I made all plaster cylinders. Each cylinder was dried under the same heat and humidity for seven days before testing. All casts were reinforced on the ends to prevent end failures.

The machine employed for testing the load capacity of the plaster cylinders was a Southwark machine of 60,000 pound capacity (fig. 5). The compression test setup is shown in figure 6. To assure uniform compression, ends of casts were sawed square and smooth and each cylinder was placed in the Southwark machine vertically between two firm rubber pads. Except when testing the strength of cast reinforcements, the compression test was considered most indicative of the strength of the plaster-crinoline combination.

In the beam-test setups (fig. 5), the cylinder rests in a wooden cradle which contacts the cylinder only at its ends. A wooden saddle sits on top of the cylinder beneath the compressing head of the Southwark machine. Cradle and saddle contacts with the cylinder were covered with rubber. Two wooden bulkheads 3 inches thick were placed in each end of the cylinder to prevent end failures. It was the area of the cylinder between the saddle ends that was being tested, and, with the type of loading shown, a uniform moment was assured.

For each individual test, two to four identical plaster cylinders were made. Additional cylinders were made later if tests on identical cylinders showed more than a slight variation in strength.

Actual figures representing results of the various tests have only a relative value. They represent results from one particular brand of plaster and crinoline. A few tests were made using different brands of plaster

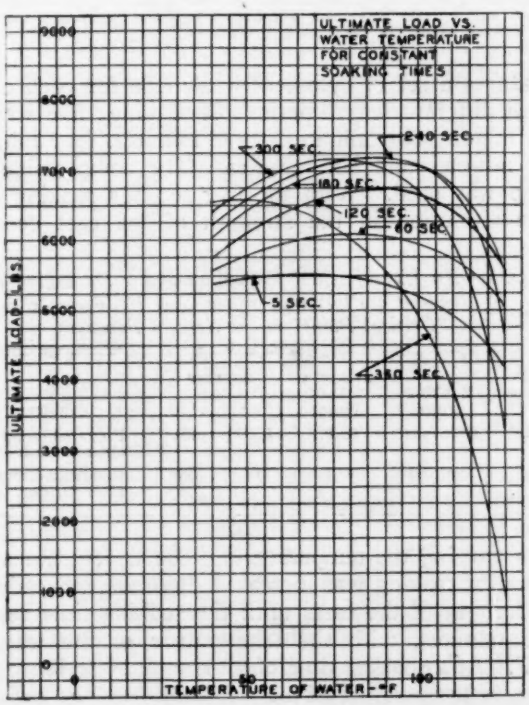


Fig. 4.—Ultimate load versus water temperature for constant soaking time.

and all showed similar values. No attempt was made to determine the relative merits of the various brands of plaster of paris now available.

EFFECT ON ULTIMATE STRENGTH OF BENDING THE CAST DURING THE SETTING PROCESS

In this experiment the compression test setup was used and the plaster bandages soaked five seconds in water at 95 F. Two series of cylinders were made, one series for control, which were undisturbed during the setting process, and the other series, in which each cast was bent once during the setting process. The bend was to an angle of approximately 25 degrees, following which the cylinder was immediately straightened and the setting process allowed to proceed to completion. Such a solitary bend was made in the cylinders during various stages of the setting process from the "fluid" to the "solid."

During the fluid stage no reduction in strength resulted from the bend. The casts bent directly after the "critical point" in the setting process showed a 77 per cent reduction in their ultimate strength, as indicated in table 1. During compression of these casts the breaking point invariably appeared at the site in which the cast had been bent. Those casts that were bent after they had become solid never regained rigidity

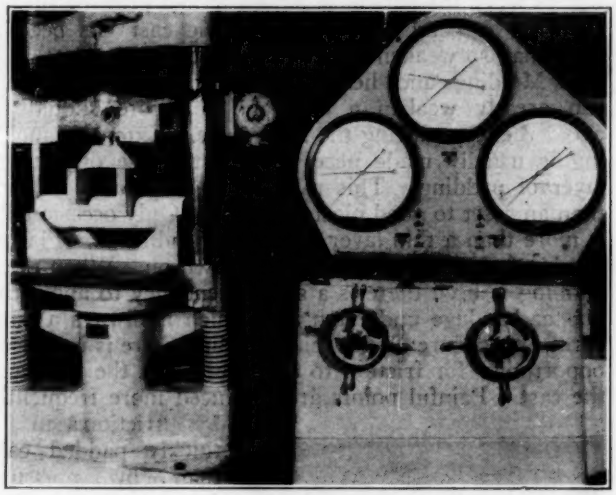


Fig. 5.—Southwark stress testing machine and the setup used for beam tests.

at the site of the bend and so were not tested. The earlier in the setting process a cast is bent, the less will be the damage to the ultimate strength; the later the bend, the greater the damage.

In analyzing several hundred defective plaster of paris casts that had been used clinically, more were found to have been weakened by having been bent or compressed following the "critical point" in the setting process than by any other single cause. Sources of erratic bendings and compression were as follows:

1. Too slow application of the cast and too rapid setting time of the plaster often lead to movements in the cast long after the "critical point." The setting time of the plaster should be sufficiently long to permit application of the cast before an appreciable degree of setting

Fig. 6.—Compression test setup.

occurs. A method of varying the setting time without the use of chemicals is to be described later.

2. Fracture fragments and joints should be placed in their proper position and alinement before the cast is applied. A change of position after the cast has been applied is not only a source of wrinkles and pressure

points inside the cast but very often greatly weakens the cast by disrupting the setting process.

3. In the case of body casts and shoulder and hip spicas, do not move the patient too soon after the cast has been applied. A bend or break in the cast often occurs when the patient is moved onto a litter or turned in bed. A bend or break after the cast has become solid may so weaken it as to render it useless.

4. Molding and heavy rubbing, if too prolonged, can greatly weaken a cast and therefore should be avoided except during the fluid stage. Extensive molding is usually made necessary by the use of a thick layer of padding. This padding is more of a liability than an asset to good plaster technic. Only occasionally is more than a thin layer of padding indicated. Plaster bandages should be laid on, not drawn on. When thick padding is used there is a strong tendency to apply the plaster bandage under tension, which is always a dangerous procedure. With thick padding there is increased opportunity for friction to occur between the skin and the cast. Painful points are produced more frequently by friction in a thickly padded cast than by pressure from casts having little or no padding.

Fig. 7.—Cast showing the shear line in a typical compression failure.

5. During its application, if a plaster bandage becomes stiff or grainy it should be discarded. If stiff, the plaster has set too much to fuse into the cast or the crinoline is defective and failed to soften when soaked. In either instance the bandage should not be used. A stiff bandage, by not adapting itself to body contours, invites pressure points. Grainy plaster is plaster that has already set and would detract from rather than add to the strength of the cast. A rubbery cast is usually the result of using partially set bandages. Plaster bandages should be applied in rapid succession so that all layers will fuse to form a solid cast. A time interval between bandages invites lamination, one of the most common defects found in plaster casts. Ideally, the entire cast should be completed before any of the plaster in it passes the "critical point" in initial set. If bottom layers set before top layers are applied, application of the top layers may create movements in the bottom layers, thus impairing their strength.

7. Wedges and large windows should not be made in green casts when avoidable. A green cast tends to compress at the site of wedging, and a large window may lead to a bend or break in the remaining circumference.

ULTIMATE STRENGTH OF PLASTER CASTS AS RELATED TO TEMPERATURE OF WATER AND LENGTH OF SOAKING TIME

In treatises on plaster of paris, little has been said of the influence of the temperature of the water and length of soaking time on the strength of the cast. Since varying the temperature of the water has a decided effect on the length of the setting time of plaster of paris, it was decided to prepare a series of plaster cylinders, graduating the soaking time and the temperature of the soaking water. Twenty-eight sets of cylinders were made, seven sets for each of four temperatures: 40, 70, 95 and 125 F. At each of these four temperatures a set of cylinders was made for each of the seven different length periods of soaking: five seconds, one minute, two minutes, three minutes, four minutes, five minutes and six minutes. The compression test setup was used. With the five seconds soaking time, little alteration in the strength of the cast occurred from varying the temperature of the water; but as the period of soaking was increased there was a steady rise in strength of the casts until the soaking time reached four minutes, with the temperature of the water at 95 F. At a soaking time of four minutes or longer and with the temperature of the water above 95 F., cylinders showed a rapid and progressive decline in strength.

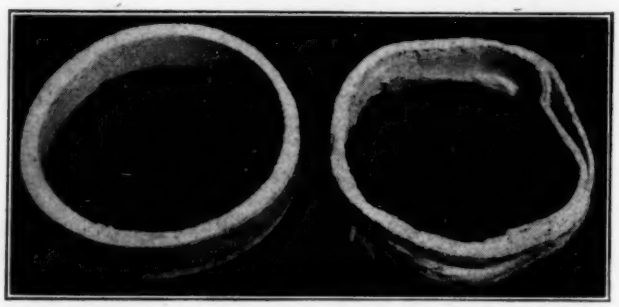


Fig. 8.—Section at left was from a cylinder made by good technic. The section at the right was from a cylinder that was bent once soon after the "critical point" in the setting process.

TABLE 1.—*An Experimental Indication of the Damaging Effect of Bending a Plaster of Paris Cast Following the "Critical Point" in the Setting Process*

Test Number	Soaking Time	Temperature of Water	Average Load (Compression)	Comment
1	5 seconds	95 F.	5,300 pounds	Prepared under optimum conditions
49	5 seconds	95 F.	3,000 pounds	One bend directly after "critical point"

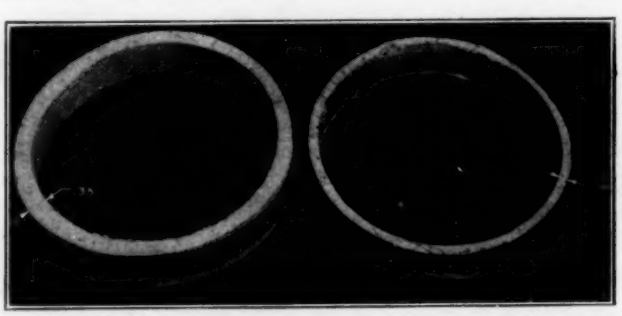


Fig. 9.—Section on right from a cylinder made of plaster bandages forcefully wrung out immediately on removal from the water, with a pronounced loss of plaster. Section on left was from a cylinder made of plaster bandages which were properly soaked and drained.

Using water at a temperature of 40 F., there was a progressive increase in strength of the casts as the soaking time was increased (five seconds to six minutes). Cylinders exhibiting the greatest resistance to compression stresses were those made with the water at 70 F. with a soaking time of four minutes.

Plaster that was deposited in the bottom of the bucket after all rolls used for each individual cast had been soaked and removed was saved and weighed. At a soaking time of five seconds the accumulation was as much as 35 per cent of the plaster originally incorporated in the bandages. When the soaking time was progressively increased, the amount of plaster in the bottom of the bucket progressively decreased until at a soaking time of three minutes to six minutes there was only an insignificant amount of plaster lost from the rolls.

Applying a cast to a wooden form is not quite the same as applying a cast to an arm or a leg. In the case of the experimental cylinders they were applied in about three minutes and allowed to set without the slightest disturbance. Since the wooden forms were rigid there was no disturbance of underlying layers as top layers were applied. In tests on the influence of long periods of soaking, the plaster frequently had thickened and setting was near the "critical point" when the bandages were removed from the soaking water. In such instances even a brief delay would have resulted in a defective case, owing to manipulation of the bandages subsequent to the "critical point" in the setting process. In those instances of long periods of soaking in which the cylinders proved to be weak, the plaster had passed the "critical point" at the time it was removed from the water or did so during the application of the bandages.

It is generally agreed that the use of such materials as salt to accelerate the setting time and sugar to retard the setting time is an unwise practice in most hands. Varying the temperature and soaking time is a good method of accelerating or retarding the setting time. At 40 F. the initial setting time was approximately three times as long as it was at 125 F. with a soaking time of three minutes.

In general it may be said that the earlier in the setting process that the cast can be completed and kept quiet until it sets, the greater the ultimate strength of the cast. In applying small casts that can be applied quickly, or if the setting time of the plaster is excessively long, it is permissible to prolong the soaking time until the plaster attains a creamy consistency. Such a practice should not be carried too far in an attempt to retain all of the plaster in the bandages.

When soaking is completed, the bandages should be gently removed from the bucket and allowed to drain for ten or more seconds in another bucket, a perforated receptacle or sink, before gently compressing out remaining excess water. Squeezing the bandage immediately on removal from the water presses out much of the plaster that could have been conserved by proper technic (fig. 9). Since plaster of paris that accumulates in the soaking water accelerates the setting time, it is best to use an abundance of water, drain the rolls outside the bucket in which they are soaked and use a bucket of water for not more than six bandages.

REINFORCEMENT OF PLASTER OF PARIS CASTS

In applying a cast to immobilize a joint moving predominantly in one plane, such as the knee and elbow, there has been a difference of opinion regarding the site for most effectively reinforcing the cast. Opinion is divided as to whether reinforcement is more effective when placed on the anterior and posterior surfaces or when placed laterally and medially. Stress engineers have long known the answer to this question. The answer evolves from a basic principle of mechanical engineering; in fact, the pattern of construction of the much used I beam is based on this principle.

By calculations (table 2) reinforcements placed front and back in a cast over a joint moving in one plane are much more effective than similar reinforcements placed on the sides. Tests were made to determine whether or not these calculations could be corroborated experimentally. Plaster cylinders were made with reinforcement at top and bottom and others with reinforcement on the sides. Cylinders were also made with all of the reinforcement on one aspect to determine whether it is better to divide the splints between two opposite aspects of the cylinder or concentrate them on one surface. Plaster splints 4 inches in width were used for the reinforcements and were incorporated into the casts their full width, except in one series of cylinders in which the splints were folded longitudinally on themselves to give a splint 2 inches wide with double the number of layers. By calculation, the narrow thick splint offers stronger reinforcement than does a wide thin splint. To complete the beam test group, a series of cylinders was made in which yucca board splints were incorporated into the casts in place of plaster splints.

The experimental results showed that anterior and posterior reinforcements added more strength to the cast than did similar reinforcement on the side, as was indicated by the calculations. There was remarkably little disparity between the calculated strength and the strength determined by experiment. By calculation the splints placed anteriorly and posteriorly should have

TABLE 2.—*Calculations*

Referring to the beam test setup (fig. 5), the moment on the center of the cylinder was:

$$\frac{P}{2} \times 8 = 4P \text{ inch pounds.}$$

8 = number of inches from each end of cradle to end of saddle.
P = pounds of force exerted on saddle.

If the maximum allowable unit stress is represented by S and the distance to the outer fiber from the neutral axis is represented by C:

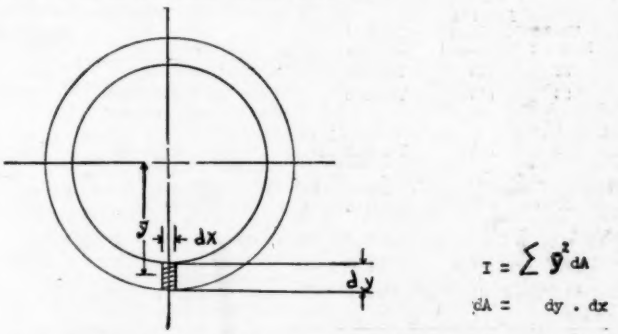
$$S = \frac{MC}{I}$$

M = Moment
I = Moment of inertia

$$M = 4P = S \times \frac{I}{C}$$

$$P = KI \left(K = \frac{SC}{4} \text{ which is constant}\right)$$

Thus, the larger the value of I, the greater load the cast will sustain. I is the moment of inertia of the cross section of the cylinder and is a function of the placement of the material.



This relationship indicates the more remote the concentration of material from the neutral axis, or axis through the center of gravity of the cross section, the greater the load carrying ability of a given cross sectional area of material. This was borne out in the beams tested (table 3).

produced casts that were 39 per cent stronger. An increase in strength as substantial as this has real practical value.

The results of test 20 (table 3) indicate that it is better to divide the splints between front and back than to place them all on the compression side. A division of the splints was an average of 26 per cent stronger.

Test 23, in which the splints were folded on themselves to produce narrow splints with double the number of layers, revealed a substantial increase in strength, as was also indicated by the calculations. The farther from the neutral axis the reinforcement is concentrated the greater will be the strength imparted to the cast. In the case of a cast applied to immobilize such joints as the knee or elbow, this means the closer to the midline anteriorly and posteriorly the reinforcement is concentrated the better for the cast. Conversely, the closer to the lateral midlines the reinforcement is placed, the less the strength contributed to the cast.

In analyzing cylinders in which wooden splints had been incorporated, a single yucca board splint was found to add more strength to a cast than a plaster splint 4 inches in width and six layers thick. In order to key nonplaster splints into the casts so that they would not separate from adjacent layers of plaster, it was necessary to make multiple perforations or notches in the splint. This procedure substantially increases the strength of the cast, especially on the tension side.

TABLE 3.—*Average Load, Type of Failure and Figure of Merit with Different Arrangements of Similar Reinforcing Plaster Splints*

Test Number	Load in Pounds (Average)	Type of Failure	Comment	Figure of Merit
31	445	Tension	No reinforcement	1.00
26	815	Tension	Three layer splint top and bottom (anterior and posterior)	1.85
24	585	Tension	Three layer splint on each side (lateral and medial)	1.31
29	605	Tension	Six layer splint on compression side (posterior)	1.36
33	760	Tension	Six layer splint 4" wide on compression side, folded longitudinally to 2" width and twelve layers	1.71

USE OF PLASTER SPLINTS OR SLABS ALONE

A point must be emphasized regarding the use of plaster splints or slabs alone; that is, without incorporating them into a cast. The principles guiding the use of splints incorporated into casts do not hold when splints are used alone. In fact, the mechanical principles involved are just the opposite in important respects. Splints used alone offer much stronger support when placed on the sides than when placed front and back. Also splints used alone are more effective when broad and thin than when narrow and thick. In applying molded plaster splints anteriorly or posteriorly, it is best to make them broad so that they extend well onto the sides. When feasible, plaster splints should be applied exclusively on the sides. By calculation it is possible for splints placed on the sides to be as much as sixteen times as resistant to bending stresses as similar splints placed anteriorly and posteriorly.

SUMMARY

1. Immobilization by encasement in plaster of paris is an indispensable part of the treatment of many war wounds and demands good plaster technic. Good plaster technic means rapid application of the cast, comfort and protection to the patient, the use of a minimum of plaster, and less difficulty in transportation.

2. Plaster of paris, a powder, transforms to crystals when mixed with water. In the crystalline state it depends principally on compact interlocking of the crystals for its rigidity and strength.

3. The "critical point" is that time in the setting process when the plaster crystals interlock and give the cast rigidity and strength. Movements of the cast, such as changes of alinement and molding after the "critical point" in the setting process, mean impairment of the ultimate strength of the cast. The later after the "critical point" the cast is manipulated, the greater will be the damage. Of the defective casts analyzed, more had been impaired by manipulation after the "critical point" than by any other single cause.

4. Detection of the "critical point" requires practice and varies with different brands of plaster, but in general it is that point when the plaster is of the consistency of thick cream and begins to lose its wet glistening character. When the appearance of the plaster has become dull and the cast is becoming firm, the "critical point" is passed.

5. Lamination of casts occurs when one layer of plaster-crinoline dries before another is applied, preventing fusion of adjacent layers. When fresh plaster is wrapped over a dry plaster surface, the dry surface should first be roughened by scratching it with a sharp knife. This is necessary when casts have to be applied in segments, e. g. a cylinder for a shaft fracture of the tibia and fibula, then the foot portion, then the thigh portion.

6. Most plaster of paris and crinoline now available is good. More unsatisfactory casts are the result of poor technic of application than derive from defective plaster of paris and crinoline. To overcome bad technic of application, a great excess of plaster is frequently used. The use of two or more times the required number of plaster rolls and splints is often observed.

7. A cast does not attain its full strength until the water within it in excess of that needed for "water of crystallization" evaporates. This process may require several hours for small casts and several days for large ones. Arrangement for air to circulate around the cast until it dries is important. If a large wet cast is kept covered with heavy bed clothing, the cast may lose its rigidity and become rubbery and useless. This is especially true in humid climates.

8. The use of such materials as sugar to retard the setting time and salt or borax to accelerate the setting time should be avoided under most circumstances. Cold water effectively retards the setting time and warm or hot water accelerates it. Varying the temperature of the water and the length of the soaking time are usually adequate to regulate the setting time. Water at a temperature of 70 to 95 F. and a soaking time of about one minute are ordinarily employed.

9. In the defective casts analyzed, more painful points resulted from friction beneath thickly padded casts than resulted from pressure when little or no padding was used. When no padding is used a plaster splint is best applied anteriorly and posteriorly before applying the plaster bandages. The bandages should be "laid on," never "drawn on."

10. With reinforcing casts that encase the ankle, knee, elbow and wrist, the reinforcement should be placed front and back and not on the sides. Major reinforcement for the shoulder in shoulder spicas should

be over the top of the shoulder and in the axilla; for hip spicas reinforcement should be placed anteriorly, posteriorly and laterally, with the strongest reinforcement laterally.

11. Splints contribute more to the strength of a cast when they are thick and narrow than when they are thin and wide. Nonplaster splints should be perforated or notched in order to key them into the cast.

12. When plaster splints and slabs are used alone and not incorporated in a cast, the rules for their application are opposite in two respects to their use in casts. In immobilizing joints moving predominantly in one plane, such as the knee and elbow, splints or slabs used alone are stronger when they extend well up on one or both sides or are used exclusively on the sides. Further, they are better used thin and broad, rather than narrow and thick.

SEMIMEMBRANOSUS BURSITIS

ASSOCIATION WITH TEAR OF THE INTERNAL MENISCUS OF THE KNEE JOINT BY COMMON TRAUMA

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NEW YORK

The usual popliteal cyst is the enlarged semimembranosus bursa. This constant bursa is located beneath the deep fascia of the popliteal space in the interval between the semimembranosus muscle and the medial head of the grastrocnemius muscle and is intimately attached to the posterior capsule of the knee joint and its bordering muscles. It may communicate with the knee joint by a small opening. Its anatomy has been well described by Wilson.[1]

Semimembranosus bursitis is not common. Wilson reported 21 cases from the Hospital for Special Surgery, and Meyerding and Van Demark[2] 15 cases from the Mayo Clinic.

Some, as Meyerding and Van Demark, state that enlargement of this bursa is not caused by trauma and is often associated with rheumatoid arthritis or osteoarthritis. Were arthritic association significant, it would be seen more often.

This report shows the clinical association by common trauma of the enlarged semimembranosus bursa and the torn internal meniscus of the knee joint. This association is not recorded in the literature dealing with semimembranosus bursitis. It has significant medicolegal import. I have operated on 3 patients in whom both the semimembranosus bursa and the torn internal meniscus were removed at the same time. A fourth patient was seen in whom a strain of the anteromedial part of the knee with questionable meniscal tear was associated with bursal enlargement. In this case only the bursa was removed.

REPORT OF CASES

The cases are briefly recorded:

CASE 1.—A man aged 38 jumped from the fender of a truck 3 feet to the ground, twisting his right knee inwardly. Since then he had had a limp, pain on the inner side of the knee and a swelling back of the knee. His knee was asymptomatic before the accident. He noted the swelling of the popliteal space four days after twisting his knee. The knee joint had not locked.

He walked with a slight right knee limp. Tenderness was present over the medial joint space and over the internal lateral ligament. A tender bursal swelling 1½ inches long and 1 inch wide was seen posteromedially. Motions of the knee were full.

A diagnosis of semimembranosus bursitis and associated strain of the internal lateral ligament with questionable meniscal injury was made. The bursa was excised on June 11, 1943, about five weeks after the date of injury. His convalescence was not eventful.

CASE 2.—A man aged 29 put his right knee out of joint on March 1, 1938 as he squatted to look under his truck. He had immediate pain on the inner side of the knee and could not extend it or bear weight on it. He heard a snap in the knee as it became locked and felt as if something blocked extension. This was the fifth locking, the first occurring on Dec. 2, 1937, when his right foot slipped on a piece of fat as he was lifting a hind of beef. The knee twisted inwardly. A snap was heard and the knee locked for a few minutes, being unlocked by extension. The interim lockings lasted one-half to one hour.

He walked with an obvious right knee limp. Extension was 170 degrees and flexion was full. The joint was stable laterally but there was slight anteroposterior instability by relaxation of the crucial ligaments. Tenderness and swelling were present over the internal joint space, and the abduction-external rotation test gave pain on the inner side of the knee. A small cyst was palpated posteriorly and medially a week after the first examination on March 5, 1943. He did know that he had it.

On March 14 the internal meniscus (bucket handle tear) and the enlarged semimembranosus bursa were removed. The postoperative course was complicated by a tourniquet palsy of the sciatic nerve, for which neurolysis of the nerve was done on May 3, 1938. He made an excellent recovery.

CASE 3.—A man aged 42 fell six steps on March 3, 1942 while carrying a carton of paper weighing 50 pounds. His right knee twisted inwardly and he landed on both hands. He noted a swelling back of the knee soon after injury. The knee was sore and occasionally swollen on its inner side. He stated that the knee snapped out of place at inconstant intervals, something slipping in the inner side of the joint. This locking was transitory and reduced by shaking the knee into place. He had no trouble with the knee before this accident.

The knee was tender over the internal lateral ligament. Extension was full although he had torn the rectus femoris muscle, but flexion was 15 degrees less than full. No effusion was present. A semimembranosus bursa 1¼ inches long and 1 inch wide was felt in the posterolateral part of the popliteal space.

He was reexamined about three to four weeks later. He stated that he could not extend his right knee and that something was blocking extension. He heard a snap on the inner side of the joint and also in the back of the knee when he inadvertently placed the knee in an awkward position. The bursal swelling had varied in size, being larger after use of the knee.

The knee extended to 175 degrees and the internal joint space was tender. The bursa was a little smaller.

On May 4, 1942 the bursa and the internal meniscus were removed. The meniscus was not loose or torn but was thickened anteriorly at the site of asbestos or silvery degeneration. The internal fat pad was slightly enlarged.

Sections of the meniscus showed nothing unusual. The cyst was thin walled and multilocular, and in areas degeneration of the cyst wall was seen.

His recovery was good.

CASE 4.—A man aged 42 caught the toe of his right shoe in a floor depression July 9, 1943 so that, as he fell forward, he twisted his right knee. He struck the anterior part of the knee against the floor. The knee could not be extended, and over a period of two to three weeks it caught many times as something slipped on the inner side of the joint. The knee had been painful and swollen.

1. Wilson, P. D.; Eyre-Brook, A. L., and Francis, J. D.: A Clinical and Anatomic Study of the Semimembranosus Bursa in Relation to Popliteal Cyst, J. Bone & Joint Surg. **20**: 963 (Oct.) 1938.
2. Meyerding, H. W., and Van Demark, N. E.: Posterior Hernia of the Knee (Baker's Cyst, Popliteal Cyst, Semimembranosus Bursitis, Medial Gastrocnemius-Bursitis and Popliteal Bursitis), J. A. M. A. **122**: 858 (July 24) 1943.

He walked with a pronounced right knee limp. The knee extended to 170 degrees and flexed to 10 degrees less than full. Tenderness was noted over the internal joint space and over the internal lateral ligament. The semimembranosus bursa was enlarged.

His condition remained unchanged except that the bursa fluctuated in size, being sometimes so small that it was difficult to palpate it. Operation on July 31 showed that the meniscus had been torn longitudinally along its inner border, the meniscal flap causing the repeated catching of the knee. The meniscus was also fragmented in the horizontal plane. There was a small amount of fluid in the joint. The bursa contained a small amount of fluid and did not communicate with the joint. It was not greatly enlarged. The meniscus and bursa were removed.

He is making an uneventful convalescence.

COMMENT

The trauma which tears the internal meniscus may also cause a semimembranosus bursitis. This is a significant association, emphasizing the need to examine the back of the knee in every case of its injury. The enlargement of the bursa may be occult or obvious, and the swelling may fluctuate in size. This may be due to passage of bursal fluid into the joint and vice versa, but it is more likely an expression of secretory and absorptive power of the bursal wall. The bursa may become fibrotic and no longer palpable. This was seen in one patient in whom only the bursa was involved. The two conditions are, however, separate entities though created by similar trauma. The associated injuries noted were strain of the internal lateral ligament in all cases, relaxation of the anterior crucial ligament in one and rupture of the rectus femoris in another. No patient was arthritic, and the trauma was clear and decisive in the production of the resultant injuries.

The significant popliteal cyst is the enlarged semimembranosus bursa, and the confusing patronym of Baker's cyst should be dropped. Trauma plays an important part in its enlargement. While the patients whom I described were all male adults in the prime period of life, I have seen this bursal enlargement in childhood and in older people. Certainly the bursa may be diseased in arthritis, but it is not a common association.

114 East Fifty-Fourth Street.

The First Hospital in America.—The first hospital in America was established by Cortez in the city of Mexico about 1524. The French established hospitals as early as 1639 in Quebec and Montreal in 1644. It is said that a hospital was opened on Manhattan Island in 1663. Many of these hospitals have had an interrupted operation to the present and their descendants have carried on in some sort of way, but hospitals in America did not really begin until the next century. The Pennsylvania Hospital (1751-56), the Philadelphia Dispensary (1786), the New York Dispensary (1791-95) and the New York Hospital (1791) are the first hospitals that can claim consecutive and successful operation from their foundation. The present Bellevue Hospital began as a room for the sick of the Public Workhouse in 1736; it moved to a new building in 1796 and became a real hospital in 1816. In 1869 it established the first city ambulance service in the world. The Massachusetts General Hospital and the MacLean Hospital for the Insane were established in Boston in 1813. There are now 6,807 hospitals in the United States with 853,378 beds and 671,832 patients.—The Hospital in Modern Society, edited by Arthur C. Bachmeyer and Gerhard Hartman, New York, Commonwealth Fund, 1943.

Clinical Notes, Suggestions and New Instruments

A TREATMENT OF PILONIDAL CYSTS AND SINUSES

A MODIFIED METHOD OF CLOSURE

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The high incidence of pilonidal cysts and sinuses found in inductees of the United States Army has aroused widespread interest in this condition. In a basic training center new inductees receive vigorous physical training, and this conditioning is prone to irritate preexisting pilonidal cysts and sinuses. In the recent literature there have been numerous descriptions of the treatment of this defect by both primary and partial closure. This brief report does not describe a new operative method but

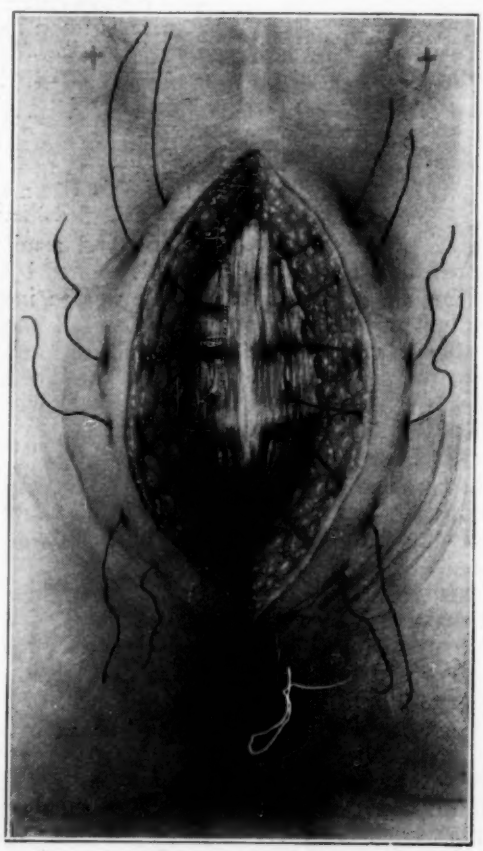

Fig. 1.—Cyst excised; sutures in place.

is an attempt to contribute to the evidence in favor of partial closure of these wounds.

There is need for a procedure which requires as short a hospital stay as possible and which will result in a firm stable scar. Our duty as Army surgeons is to repair physical defects to the best of our ability and to return the soldier to duty as soon as possible. Numerous primary or partial closure methods have been described by Cohn,[1] MacFee,[2] Woldenberg[3] and Bacon.[4] Kooistra[5] has recently reviewed the etiology and symptomatology as well as the treatment of this condition. The type of closure described in the present report varies somewhat from these methods and has given gratifying results.

From the Surgical Service of the Station Hospital, Basic Training Center No. 7, Army Air Forces Training Command, Atlantic City, N. J.

1. Cohn, Isadore J.: Am. J. Surg. **60**: 61 (April) 1943.
2. MacFee, W. F.: Ann. Surg. **116**: 687 (Nov.) 1942.
3. Woldenberg, S. C., and Sharpe, W. S.: Surg., Gynec. & Obst. **76**: 164 (Feb.) 1943.
4. Bacon, Harry: Personal communication to the authors.
5. Kooistra, Henry P.: Am. J. Surg. **55**: 3 (Jan.) 1942.

The first 37 cases at this station hospital were treated by either primary closure or excision with subsequent packing of the open wound, depending on the judgment of the operating surgeon. The primary closure method did not prove satisfactory and its use was discontinued. When the wound was packed open, better results were obtained but required a period of hospitalization of from eight to sixteen weeks. Treatment of the cysts by the use of Carnoy's or other sclerosing solutions was not attempted. The present method of treatment was then adopted and this has been carried out in the last 52 cases with a resulting shorter hospital period and more satisfactory healing of the wound. In this series of 52 cases a previous excision had been done in 4, or 7.6 per cent; previous excision and drainage had been done in 17, or 32.3 per cent.

Fig. 2.—Incision with sutures in place and tied.

PRELIMINARY TREATMENT

When a patient is admitted to the hospital, a careful examination is made to determine whether or not infection is present. Infected patients are placed on a schedule of hot sitz baths two or three times daily until all signs of the infection disappear or until fluctuation develops. If an abscess forms, a simple incision and drainage is done and the patient is permitted to return to duty as soon as the acute symptoms have subsided. Approximately two weeks after drainage ceases or all inflammation has subsided, the patient is readmitted for excision of the sinus tracts. It was noted in this series that those patients who were operated on immediately after infection subsided required a longer hospital stay before complete healing occurred.

METHOD OF TREATMENT

A cleansing enema is given the night before the operation and repeated the following morning. Nitrous oxide-oxygen anesthesia is usually employed. The patient is placed on the operating table in the prone position with a pillow under the pelvis and the head and foot of the table depressed. The buttocks are not strapped apart, for it is our impression that this distorts the soft tissues in the area to be excised with exaggeration of the defect after the adhesive tape is removed. We no longer use methylene blue or other dyes to outline the sinuses, but a probe is inserted into the sinuses to determine their direction and depth and to give an estimate of the area to be excised. An elliptic excision is used, and the skin and subcutaneous fat are removed in one block down to the sacrococcygeal fascia. Careful dissection permits one to distinguish the dirty gray appearance of the cyst wall as well as the sinus connected with it. Hemostasis is secured largely by compression, and it is seldom necessary to ligate bleeding vessels. Only occasionally is it found necessary to use a ligature for hemostatic purposes in the inferior angle of the incision. The skin edges or the subcutaneous tissues are not undermined, and the margin of the skin is attached to the sacrococcygeal fascia by interrupted mattress sutures, using number 18 silk suture as shown in the illustration. No attempt is made to approximate the skin in the midline, and every effort is made to avoid all tension, leaving an open area between the skin edges, which may vary from 0.2 to 1 cm. in width. The interrupted sutures are tied over a roll of gauze moistened with azochloramid tincture placed over the incision and covered by a snug dressing reinforced by adhesive tape. The patient is allowed to assume any position in bed that he desires. An attempt is made to prevent bowel movements for a period of four to five days by the use of camphorated tincture of opium. It was found that this is most desirable in the immediate postoperative period in order to avoid contamination of the wound and subsequent delayed healing. The sutures are removed on the sixth to ninth postoperative day and the patient is permitted to be up and about. The wounds are dressed daily either with boric acid powder or, if a defect is present, with scarlet red ointment to encourage epithelization. The patient is placed on graduated exercise beginning on the tenth postoperative day to encourage firm healing of the wound before returning to his vigorous basic training program.

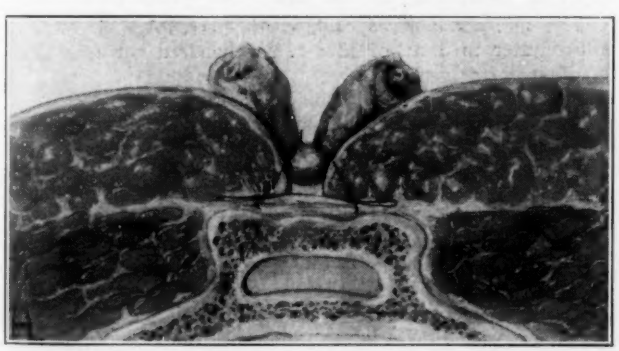

Fig. 3.—Cross section of individual suture, tied.

RESULTS

Fifty-two cases have been treated by this method with an average hospital stay of only 22.6 days. This compares most favorably with the previous series of 37 cases in which primary skin closure or excision with packing was done, with an average hospital stay of 68.4 days. By the adoption of the method described, it may be seen that the average hospital stay has been shortened approximately 46 days, which represents a saving of 2,392 days of hospitalization. Unfortunately it is impossible to follow these patients for a suitable period of time, since the men are transferred to other posts as soon as their basic training is completed. Careful follow-up of patients operated on during their stay at the post revealed that only 5 (9 per cent) had to return to the outpatient clinic for dressing. These cases all healed subsequently.

We have found that the method described gives a fair approximation of the skin margins without interference with drainage, and the wound heals almost as rapidly as when closed by primary suture. From a military standpoint it is valuable in that it permits a soldier to return to full duty in a relatively short period of time.

EASY AND ACCURATE METHOD FOR DETERMINATION OF BLOOD SULFONAMIDES FROM ONE DROP OF BLOOD FROM THE FINGER TIP

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The general practitioner has to know, during the treatment of his patient with sulfonamides, the blood level of this drug, if higher doses are given. In smaller towns, where no help of larger laboratories is available, the physician needs urgently an easy and accurate method for the determination of blood sulfonamides. Nearly each pathologic conference room has been the scene of the result of a fatal intoxication due to uncontrolled use of sulfonamides. For the general practitioner the diazotization method of Bratton and Marshall,[1] which is almost exclusively used in larger laboratories, cannot be recommended. It is for various reasons trustworthy only in hands well trained by daily exercise in examinations of this kind. But even in well trained hands the sources for mistakes are much more numerous than with the method described in this article. This method is based on a discovery of Kühnau [2] in 1938. He found

Dr. Edgar Hull, professor of medicine, gave the use of his laboratory, and Mr. C. Adams assisted in working out certain details of the method.

1. Bratton, A. C., and Marshall, E. K., Jr.: J. Biol. Chem. **128**: 537 (May) 1939.
2. Kühnau, W. W.: Klin. Wchnschr. **17**: 116 (Jan. 22) 1938.

that Ehrlich's paradimethyl-amino-benzaldehyde, the well known reagent for urobilinogen, produced a yellow dye if added to sulfonamides. The dye is a Schiff base (a base containing the radical —N=CH—), namely paradimethyl-amino-benzylidene sulfanilamide, if produced by combination with sulfanilamide. This color reaction is certainly not less, perhaps even more sensitive than Bratton and Marshall's ethylenediamine, which replaces at present the previously recommended naphthylamine as coupling reagent for the diazotization. The reason that Bratton and Marshall's method could hold its own in nearly all laboratories against methods which used Ehrlich's reagent is that these methods yielded, according to laboratory directors, not sufficient simplification, compared with the first mentioned method, or they were completely unreliable because of unsuitable simplifications. This last remark is applicable to Fuller's method.[3] This method was tried carefully according to the directions. It was found that the commercial tartrazine, with which the test paper has to be colored, may give tints of yellow so different from the yellow color produced by the combination of blood sulfonamides and Ehrlich's reagent that a comparison was impossible. Monto's method[4] is much better, but it has the disadvantage that it requires an accurate buffer solution of p_H 1.4, which makes the method unsuitable for the general practitioner. Churg[5] showed that alcohol creates a zone around the point of maximum color intensity in which changes in acidity have practically no effect on the intensity of the yellow color. Moreover, alcohol increases the intensity of the yellow color to such an extent that Ehrlich's reagent may detect 1 part of a sulfonamide in 20 million parts of fluid, probably surpassing in this respect all other reagents for sulfonamides. Churg showed in a series of 100 blood sulfonamide examinations that the method with Ehrlich's reagent, accurately performed, gave practically the same results as Bratton and Marshall's ethylenediamine method. It was considered superfluous to repeat these comparisons. The control of the method with Ehrlich's reagent by adding known quantities of sulfonamides to the blood and then determining these quantities is, according to several investigators, impossible. It seems that a small part of the added sulfonamide, varying with different blood specimens, is bound in a compound that cannot be detected by the Bratton-Marshall method or by the methods with Ehrlich's reagent. There is no danger that the blood urobilinogen interferes in a degree of practical significance with the result because the color produced by Ehrlich's reagent with urobilinogen is fifty times weaker than that with sulfonamides, according to Churg. Moreover, the quantities of urobilinogen in blood are small compared with the quantities of sulfonamides in blood after the administration of the usual therapeutic doses. Determination of the urine sulfonamides is less reliable because of the presence of oxidation products of sulfonamides.

Bodansky[6] advises that in practice only the free sulfonamides be determined because only the quantity of the free drug has clinical importance. It takes only a little more time to hydrolyze the conjugated acetyl compound, but it seems better not to determine the conjugated portion, unless requested, because too often confusion results with the two figures to the detriment of the patient. Methods for the separation of the sulfonamides from certain compounds (for instance succinylsulfathiazole) will not be discussed here, because they are described in several handbooks.

Before it was decided to work out a micro method with Ehrlich's reagent, Churg's method was tried, which, compared with its predecessors, has many advantages. The method, using sulfanilamide standards, requires, up to now, according to the description, 1 cc. of blood and has therefore to be considered as a macro method, as are all methods which use more than one drop of blood. According to experience the general practitioner prefers methods which can be performed with one drop of blood. They are less disagreeable for his patients. With Churg's method one has the choice of using either eleven standards made from sulfanilamide, which are to be replaced every three or four weeks, or standards composed of mixtures of potassium dichromate and potassium chromate, which last much longer. The author undoubtedly felt that the time consuming preparation of not less than eleven standards of sulfonamides was unpractical. Certainly this must be admitted for the general practitioner. Experience with the dichromate-chromate standards demonstrates that their colors do not correspond close enough with the colors of sulfonamide plus Ehrlich's reagent to allow accurate readings.[6a]

In view of these facts an attempt was made to determine whether it would be possible to simplify the existing methods and especially to elaborate a reliable micro method. This purpose is reached in the method described here. Compared with Bratton and Marshall's diazotization method and its important modification, described by Goth, the advantages are obvious. The method requires fewer reagents and the developed color is much more stable, which diminishes the sources of error. The readings often remained constant for two days, provided the tubes were kept in the dark. Beer's law is not applicable on the developed colored substance. However, it is applicable within limits of 0.5 mg. per hundred cubic centimeters if a dilution of the uncolored filtrate is made before the addition of Ehrlich's reagent.

METHOD

Principle.—A fourth of a cubic centimeter of blood is mixed with saponin and trichloroacetic acid. This mixture is filtered, and to the filtrate is added Ehrlich's reagent. A yellow color will appear immediately if a sulfonamide is present in the blood in a quantity of more than 0.5 mg. per hundred cubic centimeters. The yellow color is compared with the colors of four standards.

Reagents.—1. Aqueous solution of 50 mg. of saponin in 100 cc. of distilled water.

2. Twenty per cent aqueous solution of trichloroacetic acid.

3. Two per cent solution of pure Ehrlich's paradimethyl-amino-benzaldehyde in 95 per cent alcohol. It must be stored in a glass stoppered brown bottle. It remains colorless for a long period of time but should be discarded if it becomes yellow. If only a slight yellow color develops in the presence of an acid, the reagent is still satisfactory.

4. A few powders containing accurately weighed 100 mg. portions of sulfanilamide in each. From one of these powders a stock standard solution is made by dissolving it in 100 cc. of distilled water. This solution, placed in an ice box, will keep for several months. In the preparation of the standards a 10 mg. solution of sulfanilamide per hundred cubic centimeters is prepared by diluting 2 cc. of the stock standard to 20 cc. with distilled water. From this 10 mg. per hundred cubic centimeter solution four solutions are prepared:

Seven mg. per hundred cubic centimeters. Add 3 cc. of distilled water to 7 cc. of 10 mg. per hundred cubic centimeter solution.

Five mg. per hundred cubic centimeters. Add 5 cc. of distilled water to 5 cc. of 10 mg. per hundred cubic centimeter solution.

Three mg. per hundred cubic centimeters. Add 7 cc. of distilled water to 3 cc. of 10 mg. per hundred cubic centimeter solution.

One mg. per hundred cubic centimeters. Add 9 cc. of distilled water to 1 cc. of 10 mg. per hundred cubic centimeter solution.

From these four solutions the four standards are prepared as follows: Of each of these solutions 0.25 cc. is placed in each of four tubes. To each tube 4 cc. of the saponin solution and 4 cc. of trichloroacetic acid solution is added. Filtration is necessary only if there is the slightest cloudiness. Into each of four other very clean tubes, having the same diameter as has the "unknown" tube, is transferred 4 cc. of the mixtures and 2 cc. of Ehrlich's reagent. These four tubes are placed in the colorimeter. These standards keep well in an ice box certainly for two weeks.

5. A simple so-called "tube support" for color comparison. It is a piece of wood with seven holes, so that the tube with

3. Fuller, A. T.: Lancet **1**:760 (June 27) 1942.
4. Monto, R. W.: Am. J. Clin. Path., Tech. Supp. **5**:165 (Nov.) 1941.
5. Churg, Jacob, and Lehr, David: Am. J. Clin. Path., Tech. Supp. **6**:22 (March) 1942.
6. Bodansky, Meyer: Am. J. Clin. Path., Tech. Supp. **4**:151 (Nov.) 1940.

6a. These objections hold also in the case of certain equipment put on the market after this article was written.
7. Goth, A.: J. Lab. & Clin. Med. **27**:827 (March) 1942.

the unknown can be placed between any two standard tubes. A light blue glass is used as a background at the openings in the colorimeter, because some eyes can distinguish slight color differences in yellow-blue better than in yellow. Duboscq types of colorimeters and a photoelectric colorimeter may be used.

Procedure.—Take with an adequate pipet 0.25 cc. of blood from an ear lobe or finger tip. If oxalated venous blood is available for other examinations, one may use this blood. Blow the blood out in a small mortar. Add 4 cc. of saponin solution. Rub with a pestle and wait four minutes (for hemolysis). Add 4 cc. of trichloroacetic acid solution. Rub again with the pestle. Filter through a retentive filter (No. 5 Whatman) of about 6 cm. diameter. Transfer 4 cc. of the filtrate in a very clean tube. Add 2 cc. of Ehrlich's reagent. Put the tube in the colorimeter. Compare with the standards. If the color of the unknown is more intense than the standard of 7 mg. per hundred cubic centimeters take 1 cc. of the filtrate, dilute it four times (by adding 3 cc. of distilled water). Treat this solution just as the undiluted filtrate. The result of the reading is multiplied by 4.

Conversion Factors.—These are factors by which the reading must be multiplied if sulfonamides other than sulfanilamide are used. The conversion factor for sulfathiazole is 1.7 and for sulfadiazine 1.5. For other sulfonamides which survive the crucial clinical tests, one may calculate the conversion factor as follows. Because the solubility in water of the sulfonamides differs widely, it is advisable to make a 5 per cent solution from the new sulfonamide. Up to the present this has been possible with all sulfonamides. For example, in 100 cc. of distilled water at 37.5 C. the solubility of the free drug is 1,370 mg. of sulfanilamide, 92 mg. of sulfathiazole and 11 mg. of sulfadiazine.

Procedure.—Take three tubes. In the first tube put 5 cc. of a 5 mg. per hundred cubic centimeter solution of the new sulfonamide. In the second tube put 3 cc. of the 5 mg. per hundred cubic centimeter solution plus 2 cc. of distilled water. In the third tube put 1 cc. of the 5 mg. per hundred cubic centimeter solution plus 4 cc. of distilled water; 0.25 cc. of each tube is treated just as the blood filtrate. Compare the standards. Example: The color developed by a 3 mg. per hundred cubic centimeter solution of sulfadiazine corresponds with the color of a 2 mg. per hundred cubic centimeter solution of sulfanilamide. Therefore the conversion factor is 1.5.

SUMMARY

For this micro method with Ehrlich's reagent for the determination of sulfonamides in the blood, one drop of blood is sufficient for analysis. It requires less than half the number of standards used with other reliable methods dependent on Ehrlich's reagent. Moreover, it requires only one reagent; that is, two reagents less than are used in Bratton-Marshall's method. The stain which has to be compared with standards changes much more rapidly in Bratton-Marshall's method than in the methods using Ehrlich's reagent. This property makes the latter method much more reliable in less trained hands. The method can be performed easily and accurately by the general practitioner.

2231 Canal Street.

Invention of the Modern Thermometer.—Even before the invention of the modern thermometer, attempts had been made to estimate the temperature of the human body. In the seventeenth century Santorio Santorio had used a bulb filled with air and opening into a tube. The other end of the tube opened under the surface of some water in a vessel. He placed the bulb inside a person's mouth and the air inside expanded as it became warm and issued in bubbles through the water. By counting these bubbles he could gain some idea of the "hotness" of the person in question. This was an extremely rough and ready method, but it was not until almost two hundred years later that the researches of the physicists, notably Helmholtz and Sir William Thomson (Lord Kelvin), improved the thermometer and placed thermometry on a sound basis.—Haagensen, C. D., and Lloyd, Wyndham E. B.: A Hundred Years of Medicine, New York, Sheridan House, Inc., 1943.

Special Article

AMERICAN HEALTH RESORTS

ECONOMIC ASPECTS OF HEALTH RESORT THERAPY

A. M. SIMONS
CHICAGO

These special articles on spa therapy and American health resorts were prepared under the direction of the Committee on American Health Resorts. The opinions expressed are those of the authors and do not necessarily reflect the opinion of the committee. These articles may be published later as a Handbook on Health Resorts.

Value is the basic concept in economics. The question arises as to just what are the values of health resort therapy. The definition and treatment of value in the economics of industry and trade differ widely from those in the economics of medicine. In traditional or "classic" economics value is based on "utility," which is defined as follows in an American textbook on economics: [1]

> The term utility does not connote any ethical worth. Opium has economic utility as well as bread. Vice has economic utility as well as virtue. The test of economic utility is strictly that somebody wants the good. Whether the want be good or bad, it equally reflects the economic utility of the good. Utility is strictly neutral on the moral aspects of want satisfaction.

The medical profession has always had an entirely different idea of value. The Oath of Hipprocrates says:

> I will follow that method of treatment which, according to my ability and judgment, I consider for the benefit of my patients, and abstain from whatever is deleterious and mischievous. I will give no deadly medicine to any one if asked, nor suggest any such counsel.

To the medical profession, value of any element in medical practice—education, drugs, technic, institutions or organization—depends on its "utility" in preventing, diagnosing or treating disease. Emphasis is laid on what the economist calls "use value" rather than "exchange value." Such things as air, light, water, scenery commonly have very little "exchange value" but much "use value." Lacking the element of scarcity, they cannot be exchanged in the market for money or other "valuable" goods. The economists call them "free goods" and it is significant of health resorts that they depend largely on giving an exchange value to such free goods.

The dual character of health resort management and treatment constantly combines and confuses these two largely contradictory concepts of value. Practically all health resorts (although there are a few outstanding exceptions) involve two factors both of which are undoubtedly of value in the treatment of disease. The recreational "resort" phase must be operated according to the economics and ethics of business; the therapeutic treatment should be ruled by professional ethics and economics. Recreation, amusement, environment, climate, scenery certainly possess real value according to the medical concepts of the word. They do aid in restoring health. Their management, however, is based largely on the classic economic principle that anything is of value for which a monetary demand can be created. Such an economic demand may be based on as faint a

From the Bureau of Medical Economics, American Medical Association, Chicago.

1. Edie, Lionel D.: Economics: Principles and Problems, New York, Thomas Y. Crowell Company, 1926, p. 115.

"trace" of actual use value in the medical sense as some of the "traces" of elements in the analyses of mineral waters. It is difficult to adjust these conflicting ideas of value.

The valuation of the mineral waters more nearly conforms to professional standards. Even here there is much confusion with commercial considerations. New complications are introduced when the waters are bottled and their sale becomes a principal source of income. Even where the original water is not "fortified," "condensed" or transformed into a solid "extract" marketed as a powder, as is quite frequently the case, it is difficult to reconcile the conflicting ideas of value and the resulting marketing practice. Spa publicity often assumes that tradition creates therapeutic value or that value is increased by the antiquity of use, for example during Greek and Roman civilization. The publicity for American spas frequently refers to Indian patronage or to visits by Spanish explorers and early settlers. Tradition is further strengthened by reference to patrons belonging to the class that fixes fashion and social mores. The publicity of an American watering place points with pride to its long patronage by the "élite of society."

Such traditions and social sanctions help to give exchange value to otherwise "free goods"—such as climate, scenery and even the mineral waters—when access to these things is restricted. This exchange value must be large to provide and support the expensive equipment required. Hotels must be built, transportation improved, amusement devices constructed and maintained, and these can be operated with financial success only if a demand is created to support the conduct of such equipment. To create such an economic demand from the fraction of the population having sufficiently high incomes to patronize such resorts calls for a large investment, which in turn requires extensive publicity, expensive advertising and efficient solicitation. This selling effort must be directed not only to a restricted income class but, if the health restoring element is to be stressed, to the fraction of this class who are in need, or at least can be convinced that they are in need, of the health restorative facilities of the resort.

The size of the investment and the annual income necessary to sustain that investment is indicated by the fact that nine of the oldest and most highly developed spas in the United States "represent capital investments of approximately $20,000,000." [2] The same authority reports that "the average expenditure per person, the estimate being based on inquiry at the spas themselves, was $350, the total being $157,500,000." In some European nations the financial developments and publicity necessary for the maintenance of spas have called into existence extensive organizations involving not only the direct management of the spas but transportation lines and government. There have been several proposals for the formation of some such organization in the United States. A report of the Saratoga Springs Commission to the New York legislature says, concerning investments and publicity:

> The state has an investment at Saratoga in land, buildings and equipment of approximately $8,800,000; $5,600,000 paid for by the state appropriation and $3,200,000 by the R. F. C. loan. Only a minority of the people are now getting the benefit of the baths and the waters, because there has not been enough money to tell the public in general of the Saratoga Spa.
>
> In a non-revenue producing department savings may be accomplished by the reduction of expense, but where the expenditure of money is required for commercial development, as in the present case, true economy is the expenditure of sufficient moneys for advertising and promotion to produce a profit upon the moneys already spent.

The medical and professional phase of spa operation is closely involved at every point with this business side. Treatment seems to be largely devoted to convalescent and chronic cases. Since there is a decided lack of institutions for the care of the chronic sick and convalescents in this country, the spas may be looked on as filling this very important deficiency.[3]

There is an economic obstacle to adequate fulfilment of this role by spas. The overwhelming majority of chronic and convalescent patients are not in the income classes from which the majority of present spa patrons come. There are some provisions for the indigent and low income classes at Hot Springs, Ark., and Saratoga Springs, N. Y., but the economic organization of most spas cannot cater to such classes without outside subsidies and important changes in present types of operation.

European spas have made extensive arrangements to cooperate with insurance institutions and to some extent with relief organizations in providing treatment for persons chronically ill and for convalescents among the low income classes. Special arrangements are provided for the care of indigent patients in the bond purchase "contract" signed as a basis of a loan by the Reconstruction Finance Corporation to the Saratoga Springs Authority.

An ever present conflict centers around the question of where the line shall be drawn between the entertainment and medical aspects of a spa. As far as diet, exercise, entertainment, climate and general environment constitute elements in the treatment of disease, medical supervision would seem to be an essential part of the business side of the spa operation. Where the waters and baths are of real therapeutic value it seems to be generally agreed that they should be prescribed by physicians and administered under medical supervision. This supervision cannot be medically effective unless it concerns itself with many of the economic phases of spa management. Although the financial necessity of more extensive publicity than is approved by the medical profession concerning other methods of treatment may be recognized, its quality and general character should conform to the standards fixed for drugs, hospitals and therapeutic appliances.

The Principles of Ethics of the American Medical Association recognizes the distinction drawn. The sentence which declares that "solicitation of patients by physicians as individuals, or collectively in groups by whatsoever name these be called, or by institutions or organizations, whether by circulars or advertisements, or by personal communications is unprofessional" is immediately followed by the statement "This does not prohibit ethical institutions from a legitimate advertisement of location, physical surroundings and special class—if any—of patients accommodated."

This intermingling, and to some extent conflicting, combination of business and medical management undoubtedly makes efficiency in operation more diffi-

2. Report of the Saratoga Springs Commission to the Legislature, p. 51, Albany, J. B. Lyon Company, Printers, 1930.

3. For discussions of the extent of chronic disease and lack of facilities for the care see Boas, Ernst C.: A Community Program for the Care of the Chronic Sick, Hospitals **10**: 18 (Feb.) 1936. Goldwater, S. S.: The Hospitalization of the Chronically Ill, Welfare Council, New York, 1935; Institutional Care of the Chronically Ill, American Public Welfare Association, Chicago, 1940. Potter, Ellen C.: Care of Chronically Ill in New Jersey, J. M. Soc. New Jersey **38**: 27 (Jan.) 1941.

cult. This may be one of the reasons why spas seem to have an even more unstable existence than ordinary commercial undertakings. Replies to the questionnaire of the Committee on American Health Resorts brought information of a large percentage of resorts that had been closed, presumably because of financial failure, and many more that did not reply or from which mail was returned because addressees could not be located. Their prosperity seems to depend on a number of fortuitous conditions. They appear to be very sensitive to economic cycles. Catering to the higher income class makes spa treatment largely a luxury and makes the demand for their services what the economist calls highly "elastic." A small change in such a demand within the comparatively narrow range of possible patrons may cause a wide fluctuation in the percentage of services purchased.

Some further observations of the Saratoga Springs Commission apply to this conclusion:

> The fiscal year 1938-39 at the State Reservation at Saratoga Springs has very definitely reflected business conditions throughout the country. There was a decline in income from the bath houses from $189,370.50 in the previous year to $167,188.85 during the current year. The unusual circumstance associated with this decrease is the fact that it was caused almost entirely by a reduction in the percentage of higher priced treatments given. In the year just ended such extra and higher cost treatments were almost entirely neglected and a greater demand brought out for the plain mineral water baths at lower prices. Thus, the average income per treatment fell from $1.39 in 1937-38 to $1.23 in 1938-39. In addition, the number of charity treatments given increased to 24,971, which represented more than 18 per cent of the whole number of treatments. In 1937-38 the 19,482 charity treatments given were 14 per cent of the whole number.

The financial uncertainty is aggravated by the seasonal character of most spas. Many are open for less than half the year and nearly all show pronounced peaks and depressions in a chart of their annual patronage. This, in part, is due to the combination of recreational and medical features. Patronage of the recreational features is naturally higher during the "vacation" months of the year. Many spas owe much of their attraction to climatic conditions which are dependent on the seasons. Treatment of chronic disease is often "optional" and will be postponed to the most convenient and pleasant time.

All of these conditions being subject to wide fluctuations, it is not surprising that their combined effect renders spa operation financially hazardous. Manifestly continuous operation requires a sufficiently high income during profitable operation to offset the losses in the dull periods. Overhead and depreciation increase with wide variation of employment. High labor turnover and sharply fluctuating wages added to the periodic cost of assembling, training and organizing the labor force, which is greater than in a plant with unbroken operation, increase financial instability.

Many of the economic aspects of spa management are closely related to the type of ownership of the sources of the mineral water and the adjacent land. In the United States, with some notable exceptions, mineral springs have been subject to appropriation with their ownership vested in the possessor of the land on which the springs are located. Some economists have defined ownership as "the right to control the actions of others with regard to the object owned." In the cases of mineral springs such ownership would mean the right to control access to the springs and to the use of the water. The exercise of this ownership over the limited quantity of the water creates the scarcity on which exchange value can be established.

Ownership by government does not seem greatly to affect the character of the publicity used. The financial "guides" and other promotional literature issued by the spas in Germany, France, Great Britain and the Soviet Union reveal the same type of flamboyant adjectives and exaggeration of the climatic, scenic and recreational activities as is found in the advertising of most American spas. All types of such publicity seem to have the same tendency to exploit spa features as panaceas in terms long made familiar by the distributors of nostrums.

Uncertainty as to the specific therapeutic values of not only the waters but still more of the climatic, scenic and recreational features of spas encourages, rather than restricts, exaggeration in advertising their real or supposed healing power. Remedies for this condition are beginning to be applied in the fields of business and medicine. They consist in the establishment and enforcement of standards of value through research and testing. There are undoubtedly great difficulties in the application of these remedies to the values in spa treatment, although these difficulties are not necessarily insurmountable.

There is a growing tendency in this country to extend the sanitary supervision of spas by health departments. This supervision is, however, little different from that exercised over hotels, restaurants, tourist camps, resorts and other institutions the activities of which may directly or indirectly affect the public health.

There are tendencies and trends even now beginning to take shape that indicate the next steps in meeting some of the economic and medical problems of spa management. Steps have already been taken toward the formation of a national association of spas. Most commercial and industrial lines of business have already formed such trade associations and in so doing have followed the pattern of professional associations in adopting some sort of code of ethics governing their relations with one another and the public. Since the business phases of spa management are so closely intertwined with the practice of medicine, it is certain that any such code formed by an association of spas will need to be brought into harmony with the principles of ethics of the medical profession.

535 North Dearborn Street.

Council on Pharmacy and Chemistry

NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

AUSTIN E. SMITH, M.D., Secretary.

METHENAMINE (See New and Nonofficial Remedies, 1943, p. 165).

The following dosage form has been accepted:

WILLIAM R. WARNER & CO., INC., NEW YORK

Tablets Methenamine: 0.32 Gm. and 0.5 Gm.

SULFANILAMIDE (See New and Nonofficial Remedies 1943, p. 175).

The following dosage form has been accepted:

WILLIAM R. WARNER & CO., INC., NEW YORK

Tablets Sulfanilamide: 0.32 Gm.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, JANUARY 1, 1944

DEATHS OF PHYSICIANS IN 1943

The obituaries of 3,156 physicians were published in THE JOURNAL during 1943. The group included 93 women. The American Medical Directory Report Service, including the United States, possessions and Canada, recorded 3,582 deaths. Of this total 189 were Canadians, a group omitted this year from the regular obituary columns. Deducting the Canadians, a total of 237 deaths more is shown in the Report Service than were included in the published notices in THE JOURNAL.

The introduction of the accelerated program for medical students during 1942 precludes an attempt at this time to estimate accurately the net increase to the profession. An increase, however, can be assumed. As of August 14 the graduation of 5,223 students had been recorded. The expected annual average total of students to graduate under the three year accelerated program is 7,000, the heaviest total falling in 1943, when two graduations a year launched the program. On Jan. 1, 1944 the estimated physician population of the United States, exclusive of possessions and temporary foreign, was 188,159.

Age.—The average age at death was 65.2 in 1943, as compared with 65.0 in 1942 for 3,211 deaths published in THE JOURNAL. Thirty-nine physicians died between the ages of 25 and 29, 49 between 30 and 34, 71 between 35 and 39, 93 between 40 and 44, 126 between 45 and 49, 158 between 50 and 54, 270 between 55 and 59, 396 between 60 and 64, 545 between 65 and 69, 543 between 70 and 74, 371 between 75 and 79, 265 between 80 and 84, 173 between 85 and 89, 46 between 90 and 94, 9 between 95 and 99 and 2 of 100 or over.

Causes.—Heart disease continues to lead the causes of death among physicians. As is customary, when a contributary factor was returned with a primary cause, both conditions were recorded. Coronary thrombosis and occlusion accounted for 598 deaths, of which 218 occurred in the age group 60 to 69. Angina pectoris and other coronary diseases totaled 136, chronic heart valvular disease and rheumatic heart disease 35, subacute bacterial endocarditis (except rheumatic fever) 11, diseases of the myocardium and pericardium 213, and other diseases of the heart 401. Cerebral hemorrhage, thrombosis and embolism were responsible for 397 deaths, arteriosclerosis 200 and cardiovascular diseases 60. Cancer and tumors in various forms accounted for 323 deaths, 129 falling under cancer of the gastrointestinal tract. Chronic nephritis and uremia totaled 136 and acute nephritis 12. Two hundred and eighteen deaths were attributed to pneumonia, of which 6 were virus pneumonia. In the general disease classification, diseases of the circulatory system contributed to 90 deaths, diabetes 46, postoperative complications 38, other diseases of the gastrointestinal tract 36, tuberculosis 33, diseases of the prostate 32, Hodgkin's disease and leukemia 30, diseases of the nervous system 30, cirrhosis of the liver 26, other diseases of the respiratory system 25, pulmonary embolism and thrombosis 21, other diseases of the genitourinary tract 13, peptic ulcer 13, diseases of the gallbladder 12, asthma 12, other diseases of the liver 11, bacteremia, septicemia and pyemia 11, meningitis 11, pernicious anemia 10, peritonitis 9, other diseases of the blood 7, influenza 7, diseases of the brain 7, appendicitis 6, other diseases of the spinal cord 6, abscess 5, chronic arthritis 4, hernia 3, alcoholism 3, encephalitis 3, diseases of the thyroid 2, bronchitis and pleurisy 2, diseases of the bones 2 and other infectious diseases, acute articular rheumatism and Addison's disease 1 each. Senility was reported in 41 deaths, and 6 were classified as ill defined. There were 45 deaths for which no causes were returned. One death each was reported for epidemic hepatitis, glioma of the brain, gout, massive intracerebral hemorrhage due to rupture of an unidentified vessel, amebic dysentery, chronic undulant fever, agranulocytosis, pellagra, drug addiction, acute circulatory collapse following spinal anesthesia, typhus, acromegaly and myasthenia gravis.

Accidental Deaths.—Of 117 accidental deaths, automobile accidents accounted for 41. Falls were involved in 33 deaths, airplane accidents 22, trains 6, burns 6, bullet wounds 4, drowning 2, asphyxiation 1 and drugs 1. Fractures, which were also included under falls, were of the skull, hip and femur, 13 being recorded for the hip alone. There was 1 unexplained fracture. Of the unusual accidents which have been entered under a general classification, 1 physician was killed in a fall from a horse, 1 tripped over a rifle when hunting, 1 died of a skull fracture received during the Detroit race riot and 3 from burns received when they fell asleep while smoking.

Suicides and Homicides.—Forty suicides were recorded. Bullet wounds led in the method selected with 16, poison 7, drugs 5, cut arteries 4, carbon monoxide 2, drowning 2, hanging 2 and illuminating gas 1. One suicide was unexplained. Shooting was the method in the 4 homicides in the civilian group of physicians.

Miscellaneous Positions.—Among the decedents were 253 who had been teachers in medical schools, 150 of whom had reached the professorial rank; there were 5 deans, 1 associate dean, 1 president of a university and 1 teacher in a public school. One hundred and ninety-one had been health officers, 127 members of boards of health, 116 members of boards of education, 66 coroners, 65 mayors, 63 pharmacists, 45 authors, 35 bank presidents, 33 legislators, 24 members of city councils, 20 editors, 11 members of police departments, 9 clergymen, 9 postmasters, 8 missionaries, 8 lawyers, 6 dentists, 3 members of fire departments, 3 judges, 2 justices of the peace, 2 village presidents, and 1 each had been governor, intern, sheriff and alderman. One had been a member of the Austrian army, 1 chief medical officer of the Supreme Bench of Baltimore, 1 vice consul of Argentina, 1 U. S. minister to Liberia, and 1 a commercial flight surgeon.

Of the total of 3,156 physicians, 558 had served in World War I, 62 in the Spanish American War, 7 in the Civil War and 2 each in the Boxer Rebellion (China), the Boer War and the Philippine Insurrection. Thirty-two were members of the U. S. Public Health Service, 26 of the U. S. Army and 17 each of the Navy, Veterans Administration and Indian Service. Four were in the Air Corps. Twenty-seven were classified in the Army Medical Reserve Corps and 57 not on active duty, 21 were listed in the Navy Medical Reserve Corps, 2 not on active duty. Ten were in the Public Health Service Reserve. Fifty-two were classified in the medical corps of the Army of the United States, 11 not on active duty. Thirty-four were reported in the National Guard; 2 Navy men were assigned to the Marine Corps. Thirty-nine had been members of draft boards in World War I and 84 in World War II.

Association Officers.—Among the decedents 1 had been President of the American Medical Association, 3 Vice Presidents, 1 Trustee, 1 member of a council, 1 chairman of a council, 11 section officers, 1 member of the Judicial Council, 2 committee members and 38 members of the House of Delegates. In state medical societies, 45 had been president, 1 president-elect and two secretaries. Two hundred and fifty had been presidents of county medical societies.

Military Service.—Twenty physicians died in action in World War II and 105 while in military service. One, aged 26, who died in the unexplained explosion of the *Escanaba*, was classified as "killed while in military service." One, aged 29, serving with the medical corps of the Royal Army, died in action while serving in the front line during the advance in Egypt. Five died in the Pacific, 9 in the Solomon Islands, including 4 in Guadalcanal, 4 in the North African area, 1 in Sicily and 1 in a torpedoing off the coast of Cape May, N. J. Of 2 merchant marine casualties, both died in torpedoings, 1 in the North Atlantic and 1 off Iceland. Of those killed in action, 8 were between the ages of 25 and 29, 6 between 32 and 34, 1 between 35 and 39, 2 between 40 and 44, 1 between 50 and 54, 1 between 55 and 59, and 1 in the age group 60 to 64. Of those who were classified under military service, 21 died between the ages of 25 and 29, 18 between 30 and 34, 25 between 35 and 39, 15 between 40 and 44, 10 between 45 and 49, 4 between 50 and 54, 6 between 55 and 59, 5 between 60 and 64 and 1 between 65 and 69. Of the deaths in military service, 12 were attributed to coronary thrombosis or occlusion, 7 to heart disease, 1 to cerebral embolism, 5 to bullet wounds, which are also included in 6 recorded suicides, 24 to airplane accidents, 2 to burns, 4 to automobile accidents, 1 to virus pneumonia, 2 to encephalitis, 7 to some form of pneumonia, 1 to alcoholism, 1 in a bomber crash, 2 to homicide, 1 to drowning, 2 to brain tumor, 3 to meningitis, 1 to carcinoma of the brain, 4 to other types of cancer, 2 to malaria and 1 to bacterial endocarditis. The rest were classified under various physical conditions. In 1942 the obituaries of 11 physicians who died in action were published in THE JOURNAL and 37 of those who died while in military service. Thus, THE JOURNAL notices record 31 physicians who died in action during the two year period 1942-1943 and 142 who died while in military service. THE JOURNAL does not believe that the analysis of the military deaths reflects a true picture of the situation as a whole and believes that the group represents a small percentage of those recorded in Washington but not yet released for publication.

The total of 3,156 physicians includes 1 who died in Missouri but who had been a missionary in the Belgian Congo, 1 in Alaska, 1 in Switzerland, 1 in Edmonton, Canada, and 1 in Newfoundland. An editorial entitled "When and How Physicians Die," published in 1903, was the first review of deaths of physicians by THE JOURNAL. A total of 1,400 physicians gave a mean average age of death of 58.

ACETYLCHOLINE AND TRANSMISSION OF NERVE IMPULSES

From the work of Loewi, Dale and Cannon it has been generally accepted that liberation of acetylcholine is concerned in the transmission of nerve impulses across peripheral synapses and motor nerve endings. Hence it became essential to study the chemical reactions involved in the synthesis and breakdown of acetylcholine and to measure the rate of these processes in relation to the speed of the electric potential changes accompanying nerve impulses. This demonstration is a practical impossibility in ordinary nerves, which are too small for chemical studies of this nature. The use by Nachmansohn and his group of the large electric organs of certain fishes which are an accumulation of end-plates permitted the study of acetylcholine metabolism and a more accurate analysis of its relation to transmission of the nerve impulses.

This work has now provided evidence that the metabolic mechanisms like those responsible in the muscle for the mechanical energy of contraction act in nerve tissue in the synthesis of acetylcholine and thus provide electric energy of excitation. An enzyme, choline acetylase, necessary for the synthesis of acetylcholine, was extracted by Nachmansohn and Machado [1] from the electric organs and from rat's brain. According to Nachmansohn and his associates [2] this enzyme requires for its function the presence of adenosine triphosphate, which supplies energy rich phosphate bonds for the metabolic reactions involved in the formation of acetylcholine. As in muscle, adenosine triphosphate is immediately restored by the breakdown of phosphocreatine, which functions as a reservoir of energy. The rephosphorylation of phosphocreatine is then carried on through the oxidation of dextrose or pyruvic acid. An "acetylcholine cycle" was thus envisaged in which the energy necessary for acetylcholine synthesis is probably given by a chain of reactions similar to that elicited in the muscle during breakdown of carbohydrate.

The liberated acetylcholine is quickly controlled by an enzyme, cholinesterase, present everywhere in nervous tissue. Nachmansohn and his associates [3] found in the electric organs a striking parallelism between the electric discharge in volts per centimeter and the concentration of cholinesterase. The amount of cholinesterase present was sufficient to hydrolyze several milligrams of acetylcholine in a period of a few milliseconds, in agreement with the hypothesis that acetylcholine liberation might be intimately connected with the rapid transmission of impulses across synapses and nerve endings. Also the energy provided by the breakdown of phosphocreatine and hence for the resynthesis of acetylcholine was shown by Nachmansohn and his associates [2] to be sufficiently high to account for the electric energy released by the discharges, or impulses, in the electric organs. This parallelism of concentration of cholinesterase or rate of acetylcholine breakdown, and the caloric energy used in the acetylcholine resynthesis, with the electromotive force released during nerve activity, makes it likely that the metabolism of acetylcholine is the determining factor in the propagation of nerve impulses. As the action potentials of the nerve are surface phenomena, the finding of an increased concentration of cholinesterase in the nerve sheaths [4] and in the nerve endings [5] points again to a direct link between the generation of electric potential changes during nerve activity and the hydrolysis of acetylcholine.

There is much evidence that the concentration of cholinesterase is closely related to the neuronal surface area and that the liberation of acetylcholine occurs throughout the nerve pathways, in peripheral or central neurons [6] in preganglionic or postganglionic fibers [7] being only quantitatively higher in ganglions, synapses and end-plates in which there is an extensive endarborization of the nerve fibers and consequent increase in neuronal surface. It is, therefore, probable that the same mechanism, acetylcholine liberation, is responsible for the transmission phenomena not only across synapses and neuromuscular plates but along all nerve pathways.

1. Nachmansohn, D., and Machado, A. L.: The Formation of Acetylcholine: A New Enzyme, "Choline Acetylase," J. Neurophysiol. **6**: 397 (Sept.-Nov.) 1943.
2. Nachmansohn, D.; Cox, R. T.; Coates, C. W., and Machado, A. L.: Action Potential and Enzyme Activity in the Electric Organ of Electrophorus Electricus: II. Phosphocreatine as Energy Source of the Action Potential, J. Neurophysiol. **6**: 383 (Sept.-Nov.) 1943.
3. Nachmansohn, D.; Cox, R. T.; Coates, C. W., and Machado, A. L.: Action Potential and Enzyme Activity in the Electric Organ of Electrophorus Electricus (Linnaeus): I. Choline Esterase and Respiration, J. Neurophysiol. **5**: 499 (Nov.) 1942. Nachmansohn and Meyerhof.[4]
4. Nachmansohn, D., and Meyerhof, R.: Relation Between Electrical Changes During Nerve Activity and Concentration of Choline Esterase, J. Neurophysiol. **4**: 348 (July) 1941.
5. Marnay, A., and Nachmansohn, D.: Choline Esterase in Voluntary Muscle, J. Physiol. **92**: 37 (Feb. 16) 1938.
6. Chang, H. C.; Hsieh, W. M.; Li, T. H., and Lim, R. K. S.: Humoral Transmission of Nerve Impulses at Central Synapses: IV. Liberation of Acetylcholine into the Cerebrospinal Fluid by the Afferent Vagus, Chinese J. Physiol. **13**: 153 (May 20) 1938.
7. Lorente de No, R.: Liberation of Acetylcholine by the Superior Cervical Sympathetic Ganglion and the Nodosum Ganglion of the Vagus, Am. J. Physiol. **121**: 331 (Feb.) 1938.

EXPERIMENTAL DIABETES

Attention has been called in these columns [1] to the work by Dunn, Sheehan and McLetchie [2] on the action of alloxan on the islets of Langerhans in rabbits and rats. The action in rabbits they describe in some detail. They reported that a single intravenous injection of 300 mg. per kilogram would cause a selective and massive necrosis of the islets accompanied by grave disturbances of the sugar metabolism. They also stated that "so far we can say nothing about the possibility of maintaining animals alive after necrosis of the islands, nor have we obtained chronic lesions by any form of prolonged treatment." In the meantime advances of great interest to the study of experimental diabetes by means of alloxan have been recorded.

Brunschwig and his associates,[3] who confirmed the results described with respect to rabbits, found that, in the dogs which survived the intravenous injection of alloxan, hyperglycemia was followed by hypoglycemia and then a pronounced hyperglycemia, which was "sustained for two to three weeks." The islet injury in dogs was not as pronounced as in rabbits. In 3 patients with carcinomatosis they injected 220, 400 and 950 mg. per kilogram respectively of alloxan without any subjective disturbances or effect on the sugar or the nonprotein nitrogen level in the blood. In a preliminary report the Baileys [4] of the Joslin Clinic and the pathologic laboratory of the Harvard Medical School, Boston, confirm the hypoglycemic action of alloxan observed by Jacobs [5] and by Dunn, Sheehan

1. Experimental Selective Necrosis of the Islands of Langerhans, editorial, J. A. M. A. **122**: 676 (July 3) 1943.
2. Dunn, J. S.; Sheehan, H. L., and McLetchie, N. G. B.: Necrosis of the Islets of Langerhans Produced Experimentally, Lancet **1**: 484 (April 17) 1943. See also Dunn, J. Shaw; Kirkpatrick, J.; McLetchie, N. G. B., and Telfer, S. V.: Necrosis of the Islets of Langerhans Produced Experimentally, J. Path. & Bact. **55**: 245 (July) 1943.
3. Brunschwig, Alexander; Allen, J. G.; Goldner, M. G., and Gomori, G.: Alloxan, J. A. M. A. **122**: 966 (July 31) 1943.
4. Bailey, C. C., and Bailey, O. T.: The Production of Diabetes Mellitus in Rabbits with Alloxan, J. A. M. A. **122**: 1165 (Aug. 21) 1943.
5. Jacobs, H. R.: Hypoglycemic Action of Alloxan, Proc. Soc. Exper. Biol. & Med. **37**: 407 (Nov.) 1937.

and McLetchie [2] in rabbits; also the necrotic changes in the islets described by the latter investigators. The Baileys found that the hypoglycemia, "if counteracted by repeated injections of dextrose, is followed by the development of symptoms seen in human diabetes, mainly hyperglycemia, glycosuria, polydipsia, polyuria, acetonuria and lipemia." The response to insulin was prompt.

Dunn and McLetchie [6] report the production of experimental alloxan diabetes in the white rat. Here again a single subcutaneous injection of 300 mg. of alloxan per kilogram caused necrosis of islet cells, with an initial fall in the blood sugar giving way to a pronounced rise. A continuous diabetes was produced in rats by repeated subcutaneous injections of smaller quantities of alloxan; in other words, diabetes can be produced in rats at will by the selective action of alloxan on the islets. The main purpose of this review is to emphasize the importance of these new methods for the experimental study of diabetes mellitus and carbohydrate metabolism.

6. Dunn, J. S., and McLetchie, N. G. B.: Experimental Alloxan Diabetes in the Rat, Lancet **2**: 384 (Sept. 25) 1943.

Current Comment

POSTWAR GRADUATE MEDICAL EDUCATION

Great concern is frequently expressed about the provision of graduate training for thousands of medical officers who will seek such education after the war. Those whose hospital training did not extend beyond the internship will be especially concerned in this need. The responsibility of medical organizations in this matter is larger than the mere provision of the advanced training which returning physicians desire and deserve. Wartime curtailment of training in many fields of learning will leave our nation poorer in human brains and skills and available expert services, entirely apart from casualties. An uncompensated wartime loss of advanced hospital training for thousands of young doctors would reflect itself in a reduced quality of medical care for years after the war. The responsibility here is clearly an obligation not only to the young doctors but to the health and welfare of the nation. The Council on Medical Education and Hospitals has been at work for several months collecting information on postwar educational facilities. It presents a preliminary report elsewhere in this issue. The results to date are heartening; they give promise that the Council will be able at the close of the war to provide a complete printed list of all available educational opportunities. That these will be ample for the needs of returning medical officers is indicated from the present information, provided plans already begun in hundreds of institutions are continued and extended. All institutions are urged to continue their excellent cooperation with the Council in its further studies of this problem.

AMERICAN MEDICAL DIRECTORY OUT OF PRINT

The extra demand by government agencies and the armed forces has exhausted the supply of the Seventeenth (1942) Edition of the American Medical Directory. An effort is being made to buy back copies of this edition from owners who can spare them. Orders for such copies as can be secured will be filled in the order in which they are received. A Directory will not be published in 1944; possibly the next edition will not be issued until after the war. However, the Trustees will again report the status of the Directory at the meeting of the House of Delegates to be held in June 1944.

FIFTIETH ANNIVERSARY OF JOHNS HOPKINS UNIVERSITY SCHOOL OF MEDICINE

As a testimony to the fiftieth anniversary of the Johns Hopkins University School of Medicine, which opened its doors Oct. 2, 1893, a special bulletin has been published for distribution to friends of the school and to its graduates. The needs of the war effort make impossible a more elaborate celebration of this important event. The bulletin contains a story of the origin of the school of medicine and excellent portraits of those who have held professorships in many departments. One statement deals with the contributions of the school to the war effort. Finally there is a proposal for future development. The distinguished service of the Johns Hopkins University School of Medicine is so widely known by the achievements of its staff and its graduates that there remains only to congratulate all of those who have participated in its progress on having reached a golden anniversary.

VITAMIN B_1 CONTENT OF DEHYDRATED FOODS

A rapid decrease in the thiamine content of stored dehydrated meats and eggs has been reported by numerous investigators. Rice [1] noted that storage deterioration does not take place in a pet food consisting of two parts of meat or meat by-products and one part of a mixture of cracked wheat, ground barley, soya flour, bonemeal, dried skim milk and tomato paste. This suggested the presence of some unknown thiamine stabilizing chemical factor in the cereal-milk-bone mixture. To test this deduction, Rice prepared and stored two samples of dehydrated pork (6 per cent moisture), one sample containing 33 per cent of the cereal-milk-bone mixture, the other being without cereal supplement. After a week of routine warehouse storage (temperature 120 F.) the thiamine content of the unmixed dehydrated pork was reduced to 15 per cent of its original titer, while 74 per cent of the original thiamine titer was still retained in the pork-cereal mixture. Whether or not this retention was due to a vitamin stabilizing chemical factor in the mixed cereals or to physical properties has not yet been determined.

1. Rice, E. E.; Beuk, J. F., and Robinson, H. E.: Science **98**: 449 (Nov. 19) 1943.

MEDICINE AND THE WAR

In this section of The Journal each week will appear official notices by the Committee on War Participation of the American Medical Association, announcements by the Surgeons General of the Army, Navy and Public Health Service, and other governmental agencies dealing with medicine and the war, and such other information and announcements as will be useful to the medical profession.

POSTWAR GRADUATE MEDICAL EDUCATION

A Preliminary Report by the Council on Medical Education and Hospitals

Thousands of physicians whose hospital training has been interrupted by the call to military service will be seeking advanced training after the war. Therefore the Council on Medical Education and Hospitals has undertaken a study of postwar graduate educational facilities as one of its major responsibilities. A preliminary survey has been instituted to determine all available and potential facilities for advanced training in connection with intern and residency hospitals, undergraduate and graduate medical schools, departments of health, state medical associations and other agencies interested in graduate or postgraduate medical education.

Table 1.—Distribution of Residencies

Anesthesiology	350	Otolaryngology	356
Cardiology	55	Ophthalmology-otolaryngology	80
Communicable diseases	108	Orthopedics	297
Dermatology and syphilology	188	Pathology	436
Epilepsy	8	Pediatrics	474
Fractures	60	Physical therapy	101
Gynecology	188	Radiology	427
Obstetrics-gynecology	311	Surgery	1,089
Obstetrics	287	Plastic surgery	49
Malignant disease	149	Traumatic surgery	46
Medicine	1,085	Thoracic surgery	68
Mentally deficient	10	Tuberculosis	303
Neurosurgery	100	Urology	201
Neurology	136	Mixed	53
Psychiatry	549	Others	58
Ophthalmology	405		
Total			8,028

TABLE 2.—*Distribution of Postgraduate Courses*

Subjects	Number of Courses	Physicians Accommodated
General postgraduate courses	24	1,447
Allergy	2	..
Anatomy	4	28
Anesthesia	5	60
Cardiology	11	64
Electrocardiography	3	24
Dermatology and syphilology	5	12
Clinical pathology and bacteriology	8	55
Biochemistry	3	35
Hematology	4	27
Pathology	15	114
Obstetrics	8	283
Obstetrics-gynecology	7	41
Medicine	21	450
Gastroenterology	5	19
Endocrinology	3	10
Malignant diseases	1	..
Neurology	3	50
Psychiatry	13	173
Ophthalmology	12	135
Otolaryngology	12	140
Orthopedics	4	6
Pediatrics	18	352
Radiology	14	33
Surgery	21	342
Proctology	2	..
Neurosurgery	1	12
Tuberculosis	7	62
Urology	7	16
Public health	8	345
Venereal diseases	3	23
Industrial medicine	3	142
Aviation medicine	2	13
Totals	259	4,522

Information regarding postwar residencies and fellowships, basic medical science instruction, public health education and other postgraduate courses was requested from 1,267 institutions and agencies including 1,041 hospitals approved for intern and residency training. Replies have now been received from 641 hospitals, 55 medical schools, 25 departments of health, 23 state medical associations and 15 special societies and examining boards. The information obtained is most encouraging. It indicates clearly that constructive planning is under way and that institutions are anxious to cooperate to the full limit of their facilities. The Council recognizes that there will be opportunities for the development of additional high grade training programs in institutions that have not yet reached their full educational capacity. However, it does not wish to encourage the organization of new residencies, fellowships and postgraduate courses unless satisfactory facilities can be provided. While the survey is still incomplete, the following observations are of interest.

RESIDENCIES AND FELLOWSHIPS

How many residencies will be required to meet the demands of medical officers seeking advanced training after the war? There are many unknown quantities as regards the duration of hostilities, casualties among medical personnel, rate of demobilization, opportunities for permanent assignment in the Army and Navy, postwar subsidies and other economic factors. It has been estimated, however, that approximately 12,000 graduates of recent years are now serving in the armed forces whose previous training in civilian hospitals did not extend beyond the intern year. Perhaps 6,000 of this group will later seek hospital appointments. In addition there is the possibility that some 2,000 former residents may return to complete their original assignments or establish themselves in other specialties. Thus with a normal civilian complement of 5,500 residents the approved hospitals may be called on to furnish a total of 12,000 or 13,000 residencies in the immediate postwar period.

Can this demand be met?

Under normal conditions the 660 civilian hospitals approved for residency training supply facilities for approximately 5,500 resident physicians. In the present survey 545 hospitals report 8,028 residencies.

It is apparent from these figures that many institutions have almost doubled their educational capacity for postwar training. If this degree of expansion is maintained, it should be possible to develop the required twelve or thirteen thousand residencies in the approved hosptals, especially if the potentialities of the internship hospitals are also taken into consideration.

The distribution of residencies in the present survey is given in table 1.

BASIC MEDICAL SCIENCES

There is evidence in the reports of the medical schools that careful attention is being given to the problem of supplying basic medical science instruction in relation to clinical specialties during the postwar period. Up to the present time 37 schools have indicated that facilities will be available for continued training in the preclinical fields. Twelve hospitals reported affiliations with medical schools to provide supplementary instruction in basic sciences, while 24 others indicated that courses of this type would be developed in their own departments of bacteriology and pathology. From the incomplete information now at hand it is apparent that 117 positions are available in anatomy, 124 in bacteriology, 135 in pathology, 96 in biochemistry and 123 in physiology.

POSTGRADUATE COURSES

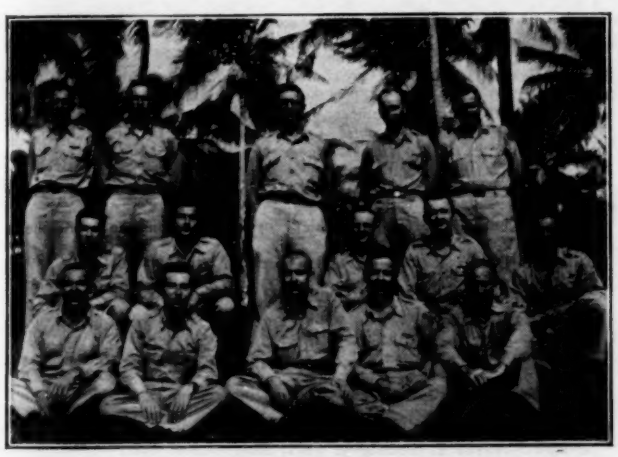
Information received from 60 hospitals, 26 medical schools and the various state medical associations and departments of health indicates that 259 postgraduate courses have been organized which can accommodate a minimum of 4,522 physicians. The capacity is obviously much larger than the number indicated, however, for the size of the class was not specified in connection with 133 of the courses listed. The distribution of these educational opportunities is shown in table 2.

This study of postwar educational facilities will be continued so that at the close of the war the Council expects to have ready for distribution a printed list of all educational opportunities available to returning medical officers and especially planned for them. The achievement of this goal will depend in large measure on a continuation of the excellent cooperation of the hundreds of institutions which have been keeping the Council informed of their postwar plans.

ARMY

FLIGHT SURGEONS IN THE SOUTH PACIFIC

Flight surgeons who are to be assigned to various units of the 13th AAF assemble at headquarters of the Air Force "somewhere in the South Pacific." They are, from left to right: First row: 1st Lieut. Daniel D. Dolce, Buffalo; 1st Lieut. Michael L. Gompertz, New York; Capt. Carl F. Wagner, Cincinnati; 1st Lieut. DeWitt C. Kissel, Pittsburgh; 1st Lieut. William C. Craig, Waynesboro, Pa. Second row: Capt. Lawrence H. Siegel, Dallas, Texas; Capt. Alfred J. Krug, Maplewood, N. J.; Major Raymond H. Vunk, Charleston, S. C. (standing); Capt. Wilbur A. Smith, Philadelphia; 1st Lieut. Edward A. Backus, Milwaukee; 1st Lieut. John L. Meyers, Shillington, Pa. Third row: Capt. Bernard J. Goldman, Detroit; Capt. Bernard L. Kreilkamp, St. Cloud, Minn.; 1st Lieut. Charles E. Cook, North Manchester, Ind.; 1st Lieut. Allen P. Newman, Carleton, Mich.



Flight surgeons in South Pacific.

AWARDED LEGION OF MERIT

The War Department announced on December 18 an award of the Legion of Merit to the following officers of the U. S. Army Medical Corps:

Lieut. Col. William R. Hallaran, formerly of Cleveland, for "exceptionally meritorious conduct in the performance of outstanding services in New Guinea. From Dec. 20, 1942 to Jan. 21, 1943 as surgeon of an advanced base Lieutenant Colonel Hallaran successfully maintained the health of the command by his tireless supervision of malaria control activities and by his development of field sanitation technics, effectively adapted to the special difficulties encountered by troops operating in the jungle. As commanding officer of a portable hospital from Dec. 20, 1942 to May 11, 1943, under primitive conditions, he operated the hospital and rendered superior service in the treatment of tropical disease cases and numerous serious battle casualties. His exemplary devotion to the improvement of the health and living conditions of the troops raised the morale and personal efficiency of officers and men alike. Lieutenant Colonel Hallaran made a vital contribution to the development of this advanced base." Dr. Hallaran graduated from Western Reserve University School of Medicine, Cleveland, and entered the service Jan. 10, 1942.

Lieut. Col. Alva E. Miller, formerly of St. Louis, was awarded the Legion of Merit for "exceptionally meritorious conduct in the performance of outstanding services in New Guinea from Jan. 21, 1943 to Aug. 12, 1943. As surgeon of an advanced base, Lieutenant Colonel Miller was charged with organizing hospitalization, evacuation, tropical disease control and sanitation. With limited personnel and under adverse conditions of weather and terrain, he progressively lowered the sick rate of the troops, planned the hospitalization in connection with expansion of the base and personally explored the rough terrain for suitable sites. At all times he gave unstintingly of his time and maintained high professional standards. On many occasions of enemy air attack Lieutenant Colonel Miller, often working between bombing runs, personally directed the removal of casualties and gave emergency treatments. His services were an important contribution to the logistic support of the successful combat operations on the north coast of New Guinea." Dr. Miller graduated from Washington University School of Medicine, St. Louis, in 1934. He has been a regular army officer since 1939.

Major (then Captain) George S. Maxfield, formerly of Waco, Texas, was awarded the Legion of Merit for "Exceptionally meritorious conduct in the performance of outstanding service as Chief of x-ray service at Amchitka during the period of Jan. 22, 1943 to Aug. 25, 1943. Under most trying conditions of weather, lack of facilities and little assistance, he rendered excellent services from his department day and night during the initial phase of the landing. In addition to his own duties he volunteered his services and took personal charge of the erection of several buildings of the station hospital. Captain Maxfield set a high example to all men he worked with and through his leadership, energy and high devotion to duty contributed greatly to the development of the medical facilities at his station." Dr. Maxfield graduated from Baylor University College of Medicine, Dallas, Texas, in 1940 and entered the service July 1, 1941.

Major (then Captain) Maurice M. Steinberg, formerly of Omaha, was awarded the Legion of Merit for "Exceptionally meritorious conduct in the performance of outstanding services

in New Guinea from Sept. 2, 1942 to June 9, 1943. Major Steinberg volunteered for service in New Guinea at a time when the security of the island was seriously threatened. Assigned as chief of the Hospitalization and Evacuation Section, Office of the Surgeon, United States Advanced Base, he organized quickly and effectively the facilities for the hospitalization and staging of large numbers of sick and wounded. During the Papuan campaign he regulated the heavy traffic of patients with remarkable precision and speed. Major Steinberg also was largely responsible for the preparation of statistical material on the basis of which many problems of the Medical Department in New Guinea were solved. His technical proficiency, his energy and his executive talent were largely responsible for dealing successfully with a most difficult situation." Dr. Steinberg graduated from Creighton University School of Medicine, Omaha, in 1935 and entered the service Jan. 25, 1941.

THREE ARMY NURSES TO RETIRE

Lieut. Col. Elsie Neff, after serving thirty-three years in the Army Nurse Corps, will retire on March 31, 1944. A graduate of Princeton Sanatorium, Princeton, Ind., she has served in the capacity of chief nurse in widely scattered areas of the United States, saw duty in the Philippines both before and after World War I, and was stationed in Hawaii from 1926 to 1930. Colonel Neff is now principal chief nurse of Fitzsimons General Hospital, Denver, where she has been serving since 1938.

1st Lieut. Christina C. MacLauchlan will retire on Jan. 31, 1944 after twenty-six years in the Army Nurse Corps. Born in Canada, she received her nursing training at the Blackstone Hospital, Pawtucket, R. I., where she graduated in 1916 and became a citizen of the United States in 1920. Joining the Army Nurse Corps in 1918, she served eleven months with Base Hospital No. 60 at Bazoilles-sur-Meuse in France. She served in the Philippine Department from 1927 to 1929 and in the Hawaiian Islands from 1937 to 1939. At the present time she is stationed at Walter Reed General Hospital, Washington, D. C., where she was promoted to the grade of first lieutenant in February 1943.

1st Lieut. Clara W. Woodruff, who has served twenty-five and a half years in the Army Nurse Corps, will retire on Feb. 29, 1944. Graduating from Sayre, Pennsylvania's Peoples' Cooperative Hospital in 1913, she specialized as a laboratory technician, in which branch she has served throughout her career in the army. She joined the Army Nurse Corps in 1918 and served with Base Hospital No. 77 in Beaune, France, for seven months, for which she received the Victoria Medal. Her only other period of overseas service was in the Philippines from 1921 to 1923. She has served in large army general hospitals in the states from coast to coast and was promoted to the grade of chief nurse in 1942. Lieutenant Woodruff is stationed at the Letterman General Hospital, San Francisco.

MAJOR ANTHONY D. D'ALFONSO AWARDED AIR MEDAL

The War Department announced on December 15 the award of an air medal to Major Anthony D. D'Alfonso of the U. S. Army Medical Corps, formerly of Philadelphia, for "Meritorious achievement while participating in aerial missions over the Solomon Islands as a flight surgeon from December 1942 to May 1943. Major D'Alfonso took part in strike and search missions over Munda, Kahili and Rekato Bay areas, acquiring a total of one hundred and fifteen hours in combat operational flights. His vigorous prosecution of his duties as surgeon and his arduous efforts to gain a better understanding of the various combat factors enabled him to cope most intelligently with ailments from combat flying. Major D'Alfonso's sound judgment and devotion to duty contributed immeasurably to the physical well-being of combat crews and elicited the confidence and admiration of his subordinates and superiors. His voluntary actions displayed a fine example of the highest soldierly qualities and are in keeping with the traditions of the United States military service." Dr. D'Alfonso graduated from Hahnemann Medical College and Hospital of Philadelphia in 1939 and entered the service Nov. 8, 1940.

THE WILLIAM BEAUMONT GENERAL HOSPITAL

The William Beaumont General Hospital is one of the six named army general hospitals which were in operation prior to the present war. The hospital was opened on July 1, 1921 and is situated ½ mile north of the limits of the city of El Paso. In 1942, however, a number of new wards and detachment barracks were built, a large additional mess hall was added and a new administration building was completed and occupied late in 1941. The hospital buildings are of hollow tile and stucco. The wards are all of the two story type, connected by covered ramps. The capacity of the hospital at present is 1,750. The professional work done at the hospital is of a general nature, although special emphasis is placed on plastic surgery.

The hospital was named for William Beaumont, the U. S. army surgeon who in 1822 made the first notable contribution to our knowledge of the action of the gastric secretions, which he was enabled to study through a wound of the stomach which failed to heal.

Col. George M. Edwards has been in command of the hospital since May 12, 1937. Other medical officers on the staff are as follows:

ADMINISTRATION

Lieut. Col. Joe H. Sanderlin, executive officer.
Capt. Raymond L. Pendleton, registrar.
Capt. Thomas W. Torgerson, receiving and disposition officer.

SURGICAL SERVICE

Lieut. Col. Granville S. Delamere, chief.
Lieut. Col. John G. Manning, chief, orthopedic section.
Major William A. Bishop, Jr., assistant chief.
Capt. William C. Basom, ward officer.
1st Lieut. Richard C. Stauffer, ward officer.
Major Henry I. Berman, chief, genitourinary section.
1st Lieut. Robert O. Beadles, assistant chief.
Capt. William Dreyfuss, ward officer.
Major William H. Frackelton, chief general and plastic surgery section.
Major Lewis L. Hall, chief, obstetric and women's surgery section.
Capt. Charles Fields, ward officer.
Major Travis M. Martin, assistant chief, surgical service; chief, surgical section.
Harry A. Jakeman, ward officer, general surgery.
Major Oscar W. Thoeny, chief, eye, ear, nose and throat section.
Capt. George A. Filmer, ophthalmologist.
1st Lieut. David Bennett, ward officer.
Capt. Arthur P. Martini, chief, physical medicine and fever therapy section.
Capt. Jacobus D. McCulley, chief, operating room and anesthesia section.
1st Lieut. Dexter R. Branch, assistant chief.

MEDICAL SERVICE

Lieut. Col. George P. Denny, chief.
Lieut. Col. Lee Palmer, assistant chief.
Lieut. Col. George T. McMahan, chief, neuropsychiatric section.
Otto L. Bendheim, ward officer.
Major Joseph Bank, chief, general medicine section.
Capt. Louis J. Cheskin, ward officer.
Capt. John M. Gibbons, ward officer.
1st Lieut. Wayne P. Beardsley, ward officer.
Major Harry D. Clark, chief, pulmonary section; internal medicine
Major Lester C. Feener, chief, cardiovascular section.
Hugh S. Espey, assistant chief.

LABORATORY SERVICE

Col. Albert G., Kinberger, chief.
Major Lester S. King, assistant.
Major William Reiner-Deutsch, San. Corps, assistant.
Capt. LaMonte A. Tucker, San. Corps, assistant.

DENTAL SERVICE

Major Crawford A. McMurray, D. C., chief.
Capt. Charles J. Bleke, D. C., assistant.
Capt. Raymond M. Davis, D. C., assistant.
Capt. Theodore G. Hollingsworth, D. C., assistant.
Capt. Milton L. Moore, D. C., assistant.
Capt. George H. Spicer, D. C., assistant.
Capt. Joseph E. Spiezio, D. C., assistant.
Capt. Kenneth W. Thomas, D. C., assistant.

X-RAY SERVICE

Major John H. Gilmore, chief.
Capt. Thomas K., Mahan, assistant chief.
1st Lieut. Harry I. Berland, assistant.

OUTPATIENT SERVICE

Lieut. Col. Wray R. Gardner, chief.
Major Maxwell Berman, assistant.
Capt. Clarence Bantin, assistant.

UNDERGROUND HOSPITAL AT CAMP JOSEPH T. ROBINSON

Underground hospitals are being built in some of our camps today so that the soldier, both medical and from other branches, will know exactly what to expect as a casualty overseas or as a medical attendant. Such a hospital, consisting of three wards, has been built at Camp Joseph T. Robinson, Arkansas. This underground hospital (the 55th General Hospital), is a training project and is practically bomb proof. It has been dug and carved from the earth and sandstone of the military terrain. The interior is finished with solid board floors, ceilings and side walls covered with insulation, and electricity and plumbing which is available in the field behind the lines of battle. Each of the three wards, connected by underground passages, is approximately 7 to 9 feet high, by 30 feet long and 15 feet wide. Three tunnels connect the passageways with the outside. Three feet of dirt rock protect the roofs of the wards. The hospital is completely equipped with x-ray equipment, blood plasma banks and the latest resuscitation elements. The hospital has its own electric generator in one of the passageways and running water in each room. Ventilators reaching to the upper ground have been constructed to serve also as emergency exits, and with the use of a "short litter," a metal frame which fits around the back of the patient, casualties can be hoisted to the open air. Lieut. Col. Charles C. Gill is in command at the Camp Joseph T. Robinson Hospital.

LIEUT. CHARLES C. SMITH AWARDED SILVER STAR

Lieut. Charles C. Smith, formerly of Charleston, S. C., has been awarded the Silver Star for gallantry in action. The citation accompanying the award read as follows: "On the 10th of July 1943 the ship on which First Lieutenant Smith was a passenger was bombed and strafed by German planes as it prepared to beach near Licata, Sicily. One halftrack was set afire and Lieutenant Smith directed and personally assisted the fire-fighting crew. He spent the remainder of the day inside the ship caring for the wounded, completely disregarding further bombing and strafing attacks. His calm, courage, absorption to duty in the face of danger, and above all his coolness under fire, was an inspiration to all army and navy personnel on board and helped immeasurably in the sustaining of a high morale during a difficult operation." Dr. Smith graduated from the Medical College of the State of South Carolina, Charleston, in 1941. He entered the service July 8, 1941 and is now serving with the armored field artillery unit of the Fifth Army in Italy.

PRISONERS OF WAR

Word has recently been received by the wife of Lieut. Orville L. Barks, formerly of Sanford, Fla., that he is a prisoner of war at Oflag 64, Germany, having been captured in Tunisia in February. Dr. Barks graduated from Washington University School of Medicine, St. Louis, in 1938 and entered the service in August 1940.

Information has recently been received that the following medical corps officers are being held prisoners of war in Concentration Camp P. G. 21 in Italy:

Capt. Francis Gallo, formerly of Winsted, Conn., who graduated from Jefferson Medical College of Philadelphia in 1934 and entered the service in April 1941.

Capt. Wilbur E. McKee, formerly of Columbus, Ohio, who graduated from Ohio State University College of Medicine in 1930 and entered the service in May 1941.

Capt. Henry J. Wynsen, formerly of Youngstown, Ohio, who graduated from Loyola University School of Medicine, Chicago, in 1941 and entered the service in September 1941.

Capt. Thomas E. Corcoran, formerly of Rock Rapids, Iowa, who graduated from the State University of Iowa College of Medicine, Iowa City, in 1938 and entered the service in February 1941.

FLIGHT SURGEONS' ASSISTANTS

A class of one hundred flight surgeons' assistants completed the course in aviation medicine at the School of Aviation Medicine, Randolph Field, Texas, November 27. Brig. Gen. Eugen G. Reinartz, U. S. Army, is commandant of the school.

NAVY

MOBILE LABORATORY TO TEST NUTRITIVE VALUE OF NAVY MEN'S DIETS

A new mobile unit has been created by the Naval Medical Research Institute, Bethesda, Md., in order to obtain detailed information on field nutrition practices. It is designed to determine accurately the nutritive values of foods used in navy menus as they are served. The mobile nutrition unit consists of a small truck which has been converted to afford facilities for collection and preservation of food samples from mess halls. It is equipped with a quick freezing unit to preserve certain food samples which will be transported to the Naval Medical Research Institute for analysis. Equipment is also provided for the determination of vitamin C content. The first field studies were conducted at Quantico, Va., under the direction of Lieut. Comdr. Clive M. McCay of the Naval Medical Research Institute, who in civilian life is professor of nutrition at Cornell University and lives in Ithaca, N. Y.

CAPT. LOUIS H. RODDIS RECEIVES WELLCOME AWARD

Capt. Louis H. Roddis (MC), U. S. Navy, has received the Sir Henry Wellcome award of 1943 of the Association of Military Surgeons of the United States. Thirteen manuscripts were submitted in competition. Dr. Roddis was the fourth successive naval officer to win this award. He graduated from the University of Minnesota Medical School, Minneapolis, in 1913. He is at present on duty at the Naval Training Station, Newport, R .I. The second award was given to Lieut. Comdr. Samuel G. Berkow (MC), U.S.N.R., Naval Hospital, Norfolk, Va., who received a life membership in the association. Honorable mention for third place was awarded to Lieut. Col. Roswell K. Brown, M. C., A. U. S., stationed at Stanford University, Calif., and to Capt. Irving M. Artel, 230th Station Hospital, Camp Van Dorn, Mississippi.

WORK OF NAVY MEDICAL CORPS PERSONNEL ON TARAWA

With the aid of three navy medical corpsmen, Lieut. Herman R. Brukardt, formerly of Menominee, Mich., is reported to have treated more than 100 men in a "pill box" hospital, with only four casualties, during the first thirty-six hours after marines struck the Japanese Gilbert Islands' bastion. The little pill box hospital was situated directly on the front lines the first two days of the brief but bitter Tarawa fighting. But despite the fact that constant Japanese machine gun bullets thudded in the little doorway, the naval crew refused to relax its efforts to save Leatherneck lives. Many of the marines with slight wounds remained around the pill box for hours helping carry the more seriously wounded in to the doctors.

NAVY PERSONALS

Capt. Joel J. White, Nashville, who served fourteen months in the South Pacific as medical officer in command of Base Hospital No. 3, will assume the duties as medical officer of the Norfolk Navy Yard, replacing Capt. James F. Hooker, who has been detached and assigned to foreign duty. Dr. White, who has been in the United States Navy for twenty-six years, started a branch hospital at Guadalcanal and spent August, September and October 1942 on Guadalcanal. He has received

the Presidential Unit Citation for his task force in the South Pacific with a star indicating engagements, the Victory Medal, the South Pacific Campaign Ribbon with star and the Haitian Legion of Merit and Honor Medal. Dr. White graduated from Vanderbilt University School of Medicine, Nashville, in 1916 and was commissioned a junior grade lieutenant in the United States Navy in 1917.

Comdr. Gordon Bennett Tayloe, formerly of Aulander, N. C., recently left the United States to become head of a hospital unit somewhere in foreign territory. Dr. Tayloe graduated from the University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore, in 1927 and on completion of his internship was commissioned in the Navy Medical Corps. Since that time he has seen service at sea and in hospitals in port cities of Washington, Portsmouth, Long Beach, Brooklyn, Philadelphia and Guam. He escaped from Guam just in time to avoid capture by the Japanese as they closed in on the islands of the Pacific. Since that time he has received special training at the Mayo Clinic and served as head of a naval hospital in Philadelphia before going overseas.

Dr. Joseph H. Barach, medical director of the Falk Clinic at the University of Pittsburgh School of Medicine, was guest speaker at the meeting of the Staff of the United States Naval Hospital at Quantico, Va., November 29. The subject of his address was "Etiologic Factors in the Transition from Mild to Severe or Fatal Diseases."

PROCUREMENT AND ASSIGNMENT SERVICE FOR PHYSICIANS, DENTISTS AND VETERINARIANS

HOSPITALS NEEDING INTERNS AND RESIDENTS

The following hospitals have indicated to the Council on Medical Education and Hospitals that they have not completed their Procurement and Assignment Service quotas for the early months of 1944:

(Continuation of list in THE JOURNAL, December 25, p. 1124)

CONNECTICUT

Undercliff, Meriden State Tuberculosis Sanatorium, Meriden. Capacity, 308; admissions, 392. Dr. Cole B. Gibson, Medical Director (resident—tuberculosis).

MINNESOTA

Swedish Hospital, Minneapolis. Capacity, 362; admissions, 10,037. Mr. R. K. Swanson, Superintendent (1 intern).

Bethesda Hospital, St. Paul. Capacity, 200; admissions, 6,369. Rev. L. B. Benson, Superintendent (3 interns).

St. Joseph's Hospital, St. Paul. Capacity, 282; admissions, 9,259. Sister St. Ignatius, R.N., Superintendent (1 intern).

OHIO

Deaconess Hospital, Cincinnati. Capacity, 200; admissions, 5,200. Mr. William F. Frersing, Superintendent (2 interns).

Massillon State Hospital, Massillon. Capacity, 3,420; admissions, 763. Dr. Arthur G. Hyde, Medical Superintendent (assistant resident—psychiatry).

Lucas County General Hospital, Toledo. Capacity, 325; admissions, 3,215. Mr. Robert R. Stewart, Acting Superintendent (2 interns).

PENNSYLVANIA

Mercy Hospital, Pittsburgh. Capacity, 680; admissions, 14,128. Sister Anna Marie, R.N., Superintendent (2 residents).

Mercy Hospital, Wilkes-Barre. Capacity, 220; admissions, 4,586. Sister Mary Avellino, R.N., Superintendent (4 interns).

VIRGINIA

Retreat for the Sick, Richmond. Capacity, 120; admissions, 3,913. Miss Alice T. Collins, R.N., Superintendent (3 residents).

WEST VIRGINIA

Chesapeake and Ohio Hospital, Huntington. Capacity, 185; admissions, 2,900. Miss Eleanora D. Koch, R.N., Superintendent (resident—medicine).

MISCELLANEOUS

WARTIME GRADUATE MEDICAL MEETINGS

Among the subjects scheduled for early presentation under the auspices of the Wartime Graduate Medical Meetings are the following at Indiantown Gap, Pa.: Dermatology, Dr. J. V. Klauder and Lieut. Comdr. H. E. Twining, January 6; Chest Surgery, Dr. J. S. Rodman, January 13; Dysenteries, Dr. H. L. Bockus, January 20; Malaria, Dr. W. Savitz and Comdr. G. W. Smith, January 27.

At Fort Monmouth, N. J.: Gastrointestinal Hemorrhages, Lieut. Comdr. J. T. Eads and Capt. S. B. Lapin, January 5; Dysenteries, H. L. Bockus and Capt. S. B. Lapin, January 12; Psychosomatic Medicine, Dr. B. P. Weiss and Major H. Swire, January 19 and 26.

At the Naval Hospital, Philadelphia: Laboratory Medicine, Dr. J. Eiman and Lieut. Comdr. H. M. Dixon, January 7; Peripheral Vascular Disease, Dr. M. Naide and Lieut. Comdr. G. C. Griffith, January 21.

At Camp Lee, Va.: Psychoneurosis, Maladjustment, Neuropsychiatry, Dr. O. B. Darden, January 7; Dysenteries, Dr. J. A. Scherer, January 14; Newer Drugs and Their Uses in Practice, Dr. H. B. Haag, January 21; Diagnosis and Treatment of Contagious Diseases, Dr. H. Walker, January 21.

At the U. S. Naval Hospital and the U. S. Naval Academy Dispensary, Annapolis, Md.: Psychoneurosis Among the Armed Forces, Dr. R. H. Guthrie, January 21; Rickettsia, Diagnosis, Treatment and Prevention, Dr. R. E. Dyer, February 18.

ARMY GENERAL PRAISES NAVY DOCTOR

Lieut. Comdr. Henry F. Strongin, formerly of New York City and now stationed at Great Lakes (Ill.), was highly praised by Major Gen. Albert W. Kenner in a personal letter which read as follows: "It was my intention to bring to the attention of the Naval Task Force surgeon the efficient manner in which you administered to our men during the trip across and the assault phase of our landing at Fedala. You were extremely cooperative with the Army medical personnel and I have no hesitance in stating that because of your efforts our men were in excellent physical condition when they engaged the enemy. Because of the exigencies of combat and the fact that the fleet sailed before I had anticipated, I failed to express my appreciation formally, through official channels." Dr. Strongin graduated from George Washington University School of Medicine, Washington, in 1921 and entered the service on Jan. 22, 1942.

PUBLIC HEALTH UNDER HITLER

DNB of October 6 states that, in order to insure the efficient employment for the members of the medical professions, all doctors, dental surgeons, dispensing chemists, midwives, dentists and dental mechanics admitted to practice who have to leave their place of work or residence because of a terror raid must report without delay to the competent professional organization in accordance with instructions issued by the reich health leader, Dr. Conti, or by their professional organization. It is in the interest of these professionals themselves that they report, since they might otherwise suffer losses.

The October 8 issue of *Le Petit Journal* quotes *Le Petit Dauphinois:* "At least 70 to 80 per cent of children show symptoms of rickets, chiefly due to the inadequate supply of milk. The deficiency of antirickets vitamins could be remedied through ray activated milk costing only a few centimes more per liter, which is not expensive when it is a matter of saving many generations. Unfortunately, a decree of Dec. 22, 1936, promulgated at the Medical Academy's request, practically prohibits a large scale use of ray activated milk. Under this decree, chemists alone may sell such milk, and naturally at prohibitive prices. The government should at once repeal the decree, which is now less justified than ever."

ORGANIZATION SECTION

OFFICIAL NOTES

THE 1944 CHICAGO SESSION

Section Representatives to the Scientific Exhibit

Following is a list of representatives to the Scientific Exhibit from each section of the Scientific Assembly:

Practice of Medicine—Dr. Thomas C. Garrett, 3803 Oak Road, Germantown, Philadelphia.

Surgery, General and Abdominal—Col. Grover C. Penberthy, Headquarters Seventh Service Command, Omaha.

Obstetrics and Gynecology—Dr. Fred H. Falls, University of Illinois College of Medicine, 1853 West Polk Street, Chicago 12.

Ophthalmology—Dr. Georgiana D. Theobald, 120 Medical Arts Building, Oak Park, Ill., chairman, Section Committee on Scientific Exhibit; Dr. A. B. Reese, New York; Dr. Derrick Vail, Cincinnati.

Laryngology, Otology and Rhinology—Dr. Paul H. Holinger, 700 North Michigan Avenue, Chicago.

Pediatrics—Dr. Sterling H. Ashmun, 117 South Main Street, Dayton, Ohio.

Experimental Medicine and Therapeutics—Dr. Robert W. Wilkins, Evans Memorial Hospital, 65 East Newton Street, Boston.

Pathology and Physiology—Dr. F. W. Konzelmann, Temple University Hospital, Philadelphia.

Nervous and Mental Diseases—Dr. F. P. Moersch, Mayo Clinic, Rochester, Minn.

Dermatology and Syphilology—Dr. Hamilton Montgomery, 102 Second Avenue S.W., Rochester, Minn.

Preventive and Industrial Medicine and Public Health—Dr. Paul A. Davis, 1436 Delia Avenue, Akron, Ohio.

Urology—Dr. John H. Morrissey, 40 East Sixty-First Street, New York.

Orthopedic Surgery—Dr. Fremont A. Chandler, 6 North Michigan Avenue, Chicago.

Gastro-Enterology and Proctology—Dr. Grant H. Laing, 104 South Michigan Avenue, Chicago.

Radiology—Dr. S. W. Donaldson, 326 North Ingalls Street, Ann Arbor, Mich.

Anesthesiology—Dr. E. A. Rovenstine, 477 First Avenue, New York.

Applications for space in the Scientific Exhibit close on February 10. Blanks may be obtained from the section representatives or from the Director, Scientific Exhibit, American Medical Association, 535 North Dearborn Street, Chicago 10.

"DOCTORS AT WAR" OPENS JANUARY 8

Doctors at War, the ninth series of dramatized network broadcasts by the American Medical Association and the National Broadcasting Company, opens January 8 and will run for approximately twenty-six weeks.

The series will continue to interpret the role of the doctor at war in a broad sense. Not only the doctor in uniform with the fighting forces, but the doctor on the home front, in industry and in public health service will be included. "All doctors are doctors at war wherever they may serve" will be the underlying theme of the program.

The program scripts will again be written by the veteran ace of medical script writers Mr. William J. Murphy, who has written for the American Medical Association all but two series and a portion of a third of previous dramatized broadcasts. The NBC orchestra will be conducted by Joseph Gallichio, well known to radio listeners. Production will be by Martin Magner, who directed the second series of Doctors at Work, predecessor program of Doctors at War. Distinguished doctors from the armed forces, from public health agencies and from civilian life will appear as summarizers on many of the programs; narrator will be Dr. W. W. Bauer.

The first four programs, with dates, titles and speakers, are as follows:

January 8. "Wings for the Wounded." Speaker, Major Gen. Norman T. Kirk, M. C., Surgeon General, United States Army.

January 15. "Abandon Ship." Speaker, Rear Admiral Ross T. McIntire (MC), chief, Bureau of Medicine and Surgery, United States Navy.

January 22. "Honorable Discharge." Speaker to be announced.

January 29. "Dangerous Hours." Speaker, Dr. Thomas Parran Jr., Surgeon General, United States Public Health Service.

Subsequent program announcements will appear in THE JOURNAL weekly and in HYGEIA monthly.

SOUTHWESTERN MEDICAL SCHOOL ON APPROVED LIST

The Council on Medical Education and Hospitals of the American Medical Association has voted to include the Medical School of the Southwestern Medical Foundation at Dallas, Texas, in its list of approved medical schools.

THE FARM FOUNDATION

The Farm Foundation was created in 1933 by a group of men who deeply desired a better life for the rural people of this nation. The founders included Alexander Legge and Frank O. Lowden. When he died, Alexander Legge left one half of his estate to the Farm Foundation. It is administered by a board of trustees which includes representatives of government, farmers, manufacturers, merchants, transportation and the universities. The director is Henry C. Taylor.

In its report covering the first ten years appears the following statement regarding medical care and the health of rural people:

In 1938 the Farm Foundation reviewed the work of medical care and health for rural people that was being carried on at various places in the United States and concluded that there was real need for an educational program to stimulate rural people to understand and solve for themselves the problems peculiar to each area.

The director of the Farm Foundation visited Nebraska and learned from rural women at a meeting in Lincoln that they would like help in developing a program of better medical care for their state.

The Farm Foundation then secured the cooperation of the University of Nebraska. The university, with financial aid furnished by the foundation, undertook the project on medical care and health of rural people. The work was started in July 1939 under the auspices of the Extension Service in Agriculture and Home Economics of the University of Nebraska. Miss Elin L. Anderson, recommended by the Farm Foundation, was put in charge.

Work on the Nebraska project was started in Dawson County. The method of approach was educational. The objective was to get farm people and their doctors to confer together on the best method of securing a more adequate health and medical program. As a result of these conferences, the rural people of Dawson County became interested in developing prepayment plans for medical care as a means of providing for themselves preventive as well as curative medical services. At Farnam in one corner of the county a medical cooperative was formed in which families pay $36 a year for general medical, surgical and hospital care. When developments of the same character in other parts of the county were blocked by some of the leaders of the county medical society, the rural people expressed the need for stronger support from their college of agriculture and the state medical society.

In the second year the educational program was extended to the entire state of Nebraska. A circular "Do We Want Health?" prepared by Miss Anderson was studied in the 1,700 home demonstration clubs in the state.

This study stimulated such interest that many round table conferences on medical care were held throughout the state. Action programs along various community health lines developed in a number of counties, but little progress was made in solving the economic problems of medical care.

The turning point in the study was reached in August 1941, when, following a state round table conference, a State Health Planning Committee was set up, composed of official representatives of the medical and dental professions, the university and certain rural organizations. This state committee gave first attention to aiding the people in sparsely settled areas in providing for themselves more adequate health services. By June 1942 the local people of Thomas County had set up a cooperative health association. For $30 a year families receive the services of a well qualified physician and a public health nurse who make regular weekly visits to the five small communities. They cover an area of 1,000 square miles, rendering medical care and conducting programs of disease prevention and health education. This project has attracted wide attention through articles describing it in the January 1943 issues of the *Country Gentleman* and the *Farm Journal and Farmer's Wife*.

Members of the Nebraska state committee have assisted also in setting up a medical project sponsored by the United States Department of Agriculture. In Hamilton County, Neb., all farm families may pool 6 per cent of their net cash income with a maximum per family of $57 for general medical, surgical and hospital care, some dental services and drugs. This project has been under way since August 1942.

The State Health Planning Committee has also given attention to enabling legislation for local public health departments. Some members of the committee were responsible for preparing the bill, planning hearings before the legislature's public health committee and preparing educational bulletins and fliers describing the need for this legislation.

Meanwhile the Nebraska Extension Service in Agriculture and Home Economics continues with a broad educational program on the medical care and health of rural people. A circular "Health on the Home Front," prepared by Miss Anderson for study by all the home demonstration clubs, has been a timely guide for wartime community health programs.

Interest in this project has spread far beyond Nebraska. Miss Anderson has been asked to serve on the Great Plains Regional Committee on Health and has already begun basic planning for this whole area. Ohio has set up a state health planning committee which has had Miss Anderson's services on three different occasions to help them think through the approach to their problem and plan the first steps in an educational and action program. Iowa and other states have made similar requests for help.

War has accentuated the problems of rural medical care so that everywhere there is a growing concern with basic planning during the war for more adequate postwar rural health programs.

The Farm Foundation believes that there are many different ways in which more adequate medical care can be acquired by rural people. Because the Farm Foundation believes that permanent improvement results from local initiative and will rather than from something superimposed from the outside, it does not urge the adoption of any specific plan or program. It holds that its function is to stimulate local interest in studying local needs and to help in the investigation of ways and means suited to the given community. It confines its efforts strictly to educational methods.

The bibliography follows:

Anderson, Elin L.: Do We Want Health? University of Nebraska College of Agriculture and U. S. Department of Agriculture Cooperating, Extension Circular 1021. Lincoln, Neb., September 1940; 32 pages.

—Health on the Home Front, University of Nebraska College of Agriculture and U. S. Department of Agriculture cooperating, Extension Circular 1923. Lincoln, Neb., 1942; 14 pages.

"Family Health Plan," q. v., was prepared to supplement this circular.

—Family Health Plan, University of Nebraska College of Agriculture and U. S. Department of Agriculture cooperating, Supplement 26. Lincoln, Neb., 1942; 8 pages.

Prepared to supplement "Health on the Home Front," q. v. Extension Circular 1023.

—Mobilizing Home Forces for a Health Campaign, University of Nebraska College of Agriculture and U. S. Department of Agriculture cooperating, Extension Circular 5-92. Lincoln, Neb., August 1942; 8 pages; mimeographed.

—Nebraska Pioneers in Rural Medical Care, *Medical Care* **2**: 303-313 (Oct.) 1942.

—Nebraska's Extension Service on the Health Front, *J. Home Econom.* **35**: 137-141 (March) 1943.

Streeter, Carroll P.: Sand Hills Medicine, *Farm J. and Farmer's Wife* **67**: 38-39 (Jan.) 1943.

Mullen, Eileen: No Doctor Shortage Here: Enterprising ranchers in the Sand Hills of Nebraska have found the way to get and keep a doctor and a nurse in their thinly populated country. *Country Gentleman* **113**: 16, 68 (Jan.) 1943.

NEW ADVISORY MEMBERS FOR CHILDREN'S BUREAU

The United States Children's Bureau announces the appointment of the following new members of the Children's Bureau Advisory Committee on Maternal and Child Health Services. These members were appointed in response to the resolution adopted by the Advisory Committee on Oct. 21, 1943, requesting that the committee be enlarged by the appointment of at least five physicians actively engaged in the private practice of medicine:

Dr. Sterling H. Ashmun, Dayton, Ohio.
Dr. Harvey F. Garrison, Jackson, Miss.
Dr. Eleanor Harvey, Newport News, Va.
Dr. John Preston, Tryon, N. C.
Dr. S. A. Thompson, Camden, Ark.
Dr. George D. Cannon, New York.

In addition, the following members of the Children's Bureau Commission on Children In Wartime have been appointed ex officio on the Advisory Committee on Maternal and Child Health Services:

Dr. Frederick H. Allen, Philadelphia.
Dr. Leona Baumgarten, New York.
Dr. Reginald M. Atwater, New York.
Dr. Franklin P. Gengenbach, Denver.
Dr. Joseph S. Wall, Washington, D. C.

MEDICAL LEGISLATION

MEDICAL BILLS IN CONGRESS

Changes in Status.—H. R. 149 has been reported to the Senate, a bill to fix a reasonable definition and standard of identity of certain dry milk solids. H. R. 3687 has been reported to the Senate with amendments, a bill to provide revenue. As reported by the Senate, the bill retains the provision under which many associations now exempt from federal income taxes under section 101 of the Internal Revenue Code will be required to file annually informational returns with the Commissioner of Internal Revenue. Associations exempted under section 101(6) and section 101(7), other than certain educational and charitable organizations, will be obligated to file such returns. The bill does not contemplate that the income of such exempt organizations will at this time be subjected to tax. The Senate Committee on Education and Labor has been conducting hearings on S. 1509, introduced by Senator Thomas, Utah, a bill to provide for the education and training of members of the armed forces and the merchant marine after their discharge or conclusion of service.

Bills Introduced.—H. R. 3846, introduced by Representative Barden, North Carolina, and H. R. 3850, by Representative Outland, California, provide for education and training of members of the armed forces and merchant marine after separation from service. H. R. 3892, introduced by Representative Miller, Connecticut, provides that prior to trial of any member of the land forces before a general or special court martial or of any member of the naval forces before a general or summary court martial, he shall be given a psychiatric examination, under the direction of the court, to determine his mental condition and the existence of any mental disease or defect.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

ARKANSAS

District Meeting.—The Ninth Councilor District Medical Society was addressed in Harrison, December 8, by:

Dr. Ruth Ellis Lesh, Fayetteville, Torsion of Ovarian Cysts in Children.
Dr. Francis T. H'Doubler, Springfield, Mo., Perforated Peptic Ulcer.
Dr. Urban J. Busiek, Springfield, Immunization Procedure.
Dr. Walter S. Sewell, Springfield, Pyelitis.
Dr. William A. Fowler, Fayetteville, The Physiology and Mechanism of Labor.

The Ninth Councilor District is made up of Baxter, Boone, Carroll, Marion, Newton and Searcy counties.

CALIFORNIA

Course in Venereal Diseases.—The University of Southern California School of Medicine, cooperating with the Los Angeles Department of Health and the state department of public health, opened a course in the diagnosis and treatment of syphilis and gonorrhea, January 3, to continue through January 14. Qualified licensed physicians are eligible for the course, which is given with the approval of the U. S. Public Health Service and the Los Angeles County Medical Association.

COLORADO

Consultation Fees of Teachers Revert to Institutions.—The board of regents of the University of Colorado, Denver, on November 19 unanimously approved the employment of full time teachers in the departments of medicine, surgery, obstetrics and gynecology and pediatrics with the understanding that all fees, if any, received by these teachers for consultation work be turned into the university treasury, the teachers' salaries to be fixed to take into account the fact that these men are not entitled to such fees themselves. This action was taken after earlier consideration and agreement "that it is very detrimental to the future of the medical school for a full time man to be allowed to carry on the private practice of medicine and consultation for his own gain," a conclusion reached at a meeting of the public policy committee of the Colorado State Medical Society with representatives of the medical school and the university. The committee went on record (1) favoring the raising of salaries of all full time heads of departments and their associates in the school of medicine, the Colorado General Hospital and the Colorado Psychopathic Hospital, Denver, to an adequate figure and (2) allowing full time men the privilege of consultation when it is arranged for through the head of the department and requested by a duly licensed doctor of medicine, the fees for the consultation to be collected by the medical school and the two hospitals and turned in to their respective funds.

CONNECTICUT

Russell Chittenden Dies.—Russell Henry Chittenden, Sc.D., emeritus director of the Sheffield Scientific School at Yale University, New Haven, died at his home in New Haven, December 26. Dr. Chittenden, who in 1934 received the honorary M.D. degree from the Connecticut State Medical Society, was a pioneer in the field of nutrition and was credited with the discovery of protein in food. Dr. Chittenden was a senior in the scientific school at Yale in 1875 when he discovered the presence of glycocoll and glycogen in scallops, said to be the first time a free amino acid in living tissue had been isolated. Dr. Chittenden was the author of a number of books on his subject and in 1907 published "The Nutrition of Man," which became a standard work on nutrition. He received his Ph.B. at the Yale Scientific School in 1875, a Ph.D. in 1880 and later degrees from other universities. He was a member of the staff at the scientific school from 1875, serving as director from 1898 to 1922, when he retired. He had once served as a member of the referee board of consulting scientific experts to the secretary of agriculture and had, in addition to holding memberships in numerous scientific groups, served as president of the American Society of Naturalists, American Physiological Society and the American Society of Biological Chemists. He became an honorary fellow of the New York Academy of Medicine in 1930. The honorary degree of doctor of medicine conferred by the Connecticut State Medical Society was the first time in one hundred and twenty-one years that the society had exercised this honor. The citation read:

This honor, now held by no living man, is about to be conferred upon you in recognition of your valuable contributions to our knowledge of the human body and because of the inspiration derived from your instruction by many who later achieved marked success in the practice of medicine.

ILLINOIS

Graduate Conference.—On December 16 the Illinois State Medical Society sponsored the Northern Illinois Post Graduate Conference at the Fort Armstrong Hotel, Rock Island. The speakers were Dr. Walter H. Nadler, Chicago, on "Nonsurgical Conditions of the Abdomen," Dr. G. Henry Mundt, Chicago, "Ear, Nose and Throat Conditions" and Dr. Lowell D. Snorf, Evanston, "The Discriminate Use of the Sulfonamides."

Chicago

Dental Society Award Goes to Dr. Luckhardt.—The Ohio State Dental Society at a meeting in Cleveland, November 8, presented its Callahan Memorial Award to Dr. Arno B. Luckhardt, professor of physiology, University of Chicago School of Medicine, for his contributions to humanity and the healing arts. The award is a gold medal.

The Fenger Lecture.—Dr. Howard T. Karsner, professor of pathology and director of the Institute of Pathology, Western Reserve University School of Medicine, Cleveland, will deliver the eighth Christian Fenger Lecture of the Institute of Medicine of Chicago and the Chicago Pathological Society at the Palmer House on February 14. Dr. Karsner's subject will be "Calcific Aortic Stenosis."

INDIANA

Appointments in Physical Therapy.—Drs. George J. Garceau and James S. Battersby, members of the staff of Indiana University Medical Center, Indianapolis, have been appointed medical supervisors of the physical and occupational therapy departments at the center. The directorship of the two departments was recently made vacant by appointment of Mrs. Winifred C. Kahmann as superintendent of the newly created occupational therapy unit in the reconditioning division in the surgeon general's office of the U. S. Army. Dr. Garceau, associate professor of orthopedic surgery in the school of medicine and chief orthopedic surgeon at the James Whitcomb Riley Hospital for Children, will have medical supervision of physical therapy and Dr. Battersby, resident surgeon at the center, will have medical supervision of the occupational therapy department.

KENTUCKY

New Health Center.—On October 5 the new quarters of the preventive section of the Louisville and Jefferson County Health Department were formally dedicated. The building cost $113,369 and is located adjacent to the Louisville General Hospital. It will house the director of health, assistant directors in charge of communicable disease control, school health, home medical care and clinics, nursing bureau, maternal and child health bureau, health education and library, food and sanitation division, general preventive clinic and venereal disease control bureau. A feature of the new building includes a general library, consisting at the present of about 500 volumes in addition to bound periodicals and encyclopedias. Prior to the installation of the library the various divisions kept their own reference books.

LOUISIANA

Hull Award Goes to Senior Student.—Dr. Herbert Derman, a member of the senior class of the Louisiana State University School of Medicine, New Orleans, was presented with the Hull Award during the annual banquet of the Louisiana State University Society of Medical Sciences. Dr. Derman is also president of the society. The recipient for the award is selected by vote of members of the society on the basis of scholastic attainments and those qualities considered most desirable in the practice of medicine.

Dr. Schenken Gives Chaille Oration.—Dr. John R. Schenken, professor of pathology and bacteriology, Louisiana State University School of Medicine, New Orleans, gave the annual Stanford E. Chaille Memorial Oration December 16. The subject was "The Carcinogenic and Carcinostatic Effects of Estrogenic Substances: A Study of the Changes in the Mammary and Prostate Glands." The lecture is sponsored

by the Orleans Parish Medical Society to perpetuate the memory of Dr. Chaille. This is the first time that a member of the society has given the lecture, which was established in 1926.

Branch Meeting on Clinical Research.—The Southern sectional meeting of the American Federation for Clinical Research was held at Charity Hospital, New Orleans, December 3-4. Among the speakers were:

Dr. John S. Harter, Jackson, Miss., The Prevention of Empyema Following Lobectomy for Bronchiectasis.
Dr. Wallace Marshall, Mobile, Ala., Pathogenesis of Keloids with Clinical Applications in Medicine and Surgery.
Drs. Byron E. Hall, Malcolm M. Hargraves and Charles H. Watkins, Rochester, Minn., Treatment of Polycythemia Vera with Radioactive Phosphorus.
Dr. Joseph S. D'Antoni, New Orleans, Diodoquin Therapy in Amebiasis.
Dr. William K. Purks, Vicksburg, Miss., Postural Hypotension.
Dr. John C. Henthorne, Jackson, Fibrous Tumors of the Female Breast.
Dr. John B Johnson Jr., Washington, D. C., Physiologic and Clinical Effects of Acacia in the Treatment of Nephrotic Edema.

MASSACHUSETTS

Licenses Revoked.—The Massachusetts Board of Registration in Medicine on November 19 revoked the license to practice medicine of Dr. Aaron O. Bernstein, Athol, because of misconduct in the practice of his profession. The license of Dr. Manford R. Spalding was revoked October 6. Dr. Spalding had been found guilty of narcotic charges and sentenced to six months in the House of Correction in Salem.

The Dunham Lectures.—Dr. Frank Macfarlane Burnet, assistant director and head of the virus department, Walter and Eliza Hall Institute of Research in Pathology and Medicine, Royal Melbourne Hospital, Melbourne, Australia, spoke under the Edward K. Dunham Lectureship for the promotion of the medical sciences at Harvard Medical School, Boston, January 10, 12 and 14, on "Some Virus Diseases of Man—Evolutionary and Ecological Considerations." Individual titles will be "The Origins of Human Infectious Disease," "Herpes and Poliomyelitis" and "Influenza."

Obstetric Meeting.—The New England Obstetrical and Gynecological Society held its fifteenth annual meeting at the Harvard Club, Boston, December 8. The program consisted of clinics and pathologic conferences and included:

Dr. Louis E. Phaneuf, Boston, Complete Tears of the Perineum and Rectovaginal Fistulae.
Dr. Roy J. Heffernan, Brookline, Mass., The Use of the Sulfanilamide Gauze Pack in Obstetrics and Gynecology.
Dr. Maurice O. Belson, Boston, The Diagnosis of Early Carcinoma of the Cervix.
Dr. S. Charles Kasdon, Boston, The Rh Factor in Obstetrics and Gynecology.
Dr. Philip B. Keitlen, Pittsburgh, X-Ray Pelvimetry on the Obstetrical Service of a General Hospital.
Dr. Arthur T. Hertig, Boston, Spontaneous Abortion—Pathogenesis and Treatment.
Dr. John Rock, Boston, The Incidence of Tuberculous Endometritis in Endometrial Biopsies for the Diagnosis of Infertility.
Dr. Edwin F. Daily, Washington, D. C., Emergency Maternity and Infant Care Programs.

MICHIGAN

Changes in Health Officers.—Dr. John W. O'Neill, St. Charles, has been appointed health officer of district number 5, including Newaygo, Lake and Oceana counties, succeeding Dr. Albert C. Edwards. Dr. O'Neill's headquarters will be in White Cloud.——Dr. Lars W. Switzer, Manistee, resigned as director of the Manistee-Benzie County health department December 1 to become associated with General Motors Corporation, Bay City.

Battle Creek Sanitarium Continues.—The Battle Creek Sanitarium, operating in a group of buildings on the west side of Washington Avenue, Battle Creek, will continue its activities, carrying out the wishes of its late director, Dr. John H. Kellogg. Late in 1942 the activities of the sanitarium were transferred to this group of buildings after the physical plant of the sanitarium had been converted into the Percy Jones General Hospital by the government. One building had been built for sanitarium purposes and had been used as an annex. Another building with a gymnasium, library rooms, assembly hall, administration offices and laboratories had been built and used by Battle Creek College, which suspended operation a number of years ago on account of financial difficulties. A third building gives the sanitarium accommodations of about 300 beds. Despite the fact that the main buildings had been transferred to military purposes, the activities of the sanitarium have been going on. The work of the sanitarium was not interrupted for even one day during the removal.

MISSISSIPPI

New Members of Board of Health.—Dr. Reuben B. Caldwell, Baldwyn, has been appointed a member of the state board of health to succeed Dr. James W. Lipscomb, Columbus, president of the board since 1932, and Dr. Paul G. Gamble, Greenville, will succeed Dr. Leonidas B. Austin, Rosedale, a member of the board for nineteen years.

MISSOURI

The Terry Lectures.—At a meeting of the St. Louis Medical Society December 21, lectures under the Robert J. Terry Lectureship were presented by Dr. Henry Pinkerton, St. Louis, on "Typhus Fever, Rocky Mountain Spotted Fever and Other Rickettsial Diseases" and Comdr. Alphonse McMahon and Lieut. Comdr. James M. Macnish (MC), U. S. Naval Reserve, "Diseases in the South Pacific with Special Reference to Diseases of the Tropics."

Personal.—Dr. Homer A. Sweetman, acting resident psychiatrist at the Malcolm A. Bliss Psychopathic Institute, St. Louis City Hospital, has been appointed superintendent of the St. Louis City Infirmary.——Dr. Paul J. Schrader has resigned as superintendent of State Hospital number 2 at St. Joseph. ——Dr. Major G. Seelig, director of pathology at the Barnard Free Skin and Cancer Hospital, St. Louis, and professor of clinical surgery, Washington University School of Medicine, has been appointed a member of the Missouri State Cancer Commission by Governor Forrest C. Donnell.

State Survey Authorized to Determine Medical Education Needs.—The curators of the University of Missouri, Columbia, have approved a survey of the state's needs and resources for medical education preliminary to the establishment of a university policy regarding the institution's participation in medical education and conditions under which the program should be carried on, newspapers reported recently. The action, which has been under consideration by the board for several months, was formally approved at a meeting in St. Louis with the understanding that the study place special emphasis on the means, if any, through which graduates of the medical school may be induced to practice in the rural areas of Missouri. Newspapers stated that extent of the school's curriculum has been a particular problem since 1910, when the university dropped the final two or clinical years of medical instruction, requiring graduates of its medical school to transfer on their graduation with a bachelor's degree to some other institution for the final two years of instruction leading to the degree of doctor of medicine. In 1942 Kansas City alumni of the university proposed establishment of the clinical years of medical work at Kansas City, and the city offered use of its general hospital for the purpose. Recently the curators of the university withdrew their first approval of this plan. Members of the board of curators and of the medical school staff will conduct the survey. Medical schools to be visited will include those of the universities of Michigan, Ann Arbor, Virginia, Charlottesville, Wisconsin, Madison, and Tennessee, Memphis. The schools at Illinois, Chicago and Iowa City, have already been inspected as a part of the program. According to newspaper reports, among the subjects to be stressed in the survey is the future status of the two year medical school in the face of changing practices in medical instruction, which have made some authorities take the view that the two year plan is now obsolete, or the necessity for having the full four year course at the same site because of changes in instruction methods, and the financial commitments which would be involved in the maintenance of a full four year curriculum.

NEW YORK

Personal.—The Cortland County Board of Health is still seeking a successor for Dr. William E. Mosher Jr., Cortland, in order that he may be released for military service. Dr. Mosher, who had expected to enter military service, is still health commissioner in Cortland County. Dr. Bernard McD. Krug, New York, who was announced recently as the successor to Dr. Mosher, is unable to accept the appointment.

Submission of Malaria Specimens.—Effective January 1 the state sanitary code has been amended to require the submission of a thick film as well as a thin film when a diagnosis of malaria is considered, according to *Health News*. Both thick and thin films of blood on glass slides should be collected preferably between twelve and twenty-four hours after a chill (slide outfit). Stressing the importance of the manner in which the blood films are prepared, *Health News* has made available recommendations for the procedure.

Bequest Creates Professorship of Medicine.—The Edward C. Reifenstein professorship of medicine will be set up at Syracuse University through a stipulation in the will of the late Horace White, formerly governor of New York. After establishing life trust funds of $200,000 the will provides that three fourths of the residuary estate shall go to Cornell University at Ithaca and one fourth to Syracuse, the latter to be known as the Horace White Fund and the income to be used to pay the salary for the Reifenstein professorship. The $200,000 set up for life trusts will ultimately go to the two universities in their proportionate shares, *Science* reports.

New York City

Lois Miller Honored.—Mrs. Lois Mattox Miller, at a formal gathering of the Academy of Science in Havana, December 6, was made a commander of the Order of National Merit. Mrs. Miller, a member of the editorial staff of *Reader's Digest* and a writer on medical topics, was given the award in recognition of her work in the field of tropical medicine. She has also been made a life member in the Medical Society of Cuba.

Scientists Honored.—Duncan A. MacInnes, Ph.D., member of the Rockefeller Institute for Medical Research, was elected president of the New York Academy of Sciences at its annual meeting December 15. Life membership was awarded to Dr. Alexander Fleming, University of London, Sir Frederick Gowland Hopkins, University of Cambridge, Dr. Oswald T. Avery, Rockefeller Institute, Alfred L. Kroeber, Ph.D., director of the museum of anthropology, University of California, Berkeley, Arne V. Tiselius, biochemist of the University of Uppsala, Sweden, and T. Svedberg, head of the physical chemistry institute of the University of Uppsala.

Biologic Appointments to Research Laboratories.—Recent appointments to the staff of the biologic division of Food Research Laboratories, Long Island City, include Nathan Rakieten, Ph.D., formerly of the Laboratory of Applied Physiology, Yale University, New Haven, Conn., and lately first lieutenant in the U. S. Army Air Corps, and Roslyn T. Roth, Ph.D., formerly research microanalyst at New York University and more recently biochemist at New York Psychiatric Institute, Columbia Medical Center. Dr. Rakieten will supervise the animal laboratories, and Dr. Roth will specialize in the statistical aspects of the design and interpretation of bioassays.

TEXAS

Chamber of Commerce Controls Health Unit.—On October 7 a city ordinance was passed by the city council in San Antonio which places the control of the health unit under the direction of the local chamber of commerce. Nominations of the new board of seven members were to be made by the directors of the chamber of commerce, their terms to be two years. Physicians named to the new board are Drs. Patrick I. Nixon and Herbert J. Schattenberg.

Dr. Ewalt Named Acting Director of Psychopathic Hospital.—Dr. Jack R. Ewalt, associate professor of neuropsychiatry at the University of Texas Medical Branch, Galveston, and director of the electroencephalography unit of the John Sealy Hospital, has been appointed acting director of the Galveston State Psychopathic Hospital. The latter institution was closed in the summer by the state board of control on the basis that the buildings housing its operating staff had suffered storm damage.

New Appointments at Texas.—Charles M. Pomerat, Ph.D., professor of biology, University of Alabama, University, has been appointed professor of anatomy at the University of Texas Medical Branch, Galveston. R. W. Strandtmann, Columbus, Ohio, is now assistant professor of entomology in the department of preventive medicine and public health at the medical school. Ardell N. Taylor, Ph.D., formerly with the University of Texas, Austin, is now instructor in physiology at the medical branch and Dr. Jewell G. Hamrick, Dallas, instructor in pathology. George A. Emerson, Ph.D., associate professor of pharmacology, West Virginia University School of Medicine, Morgantown, has been named professor of pharmacology at the school.

VIRGINIA

Governor Challenges Physicians to Provide Lower Costs.—At a meeting of the Seaboard Medical Association in Richmond, December 2, a resolution was adopted to "take all possible steps to influence the enaction of laws for a more adequate distribution of medical and hospital care," the resolution to be sponsored by the medical profession of North Carolina and Virginia. To implement the program the association urged the appointment of a special committee to confer with Governor Broughton of North Carolina and Governor Darden of Virginia for the purpose of suggesting and sponsoring such legislation as will be in keeping with the best traditions of the medical profession and serve the best interests of the public as a whole. The action followed the earlier warning of Governor Darden in an address in which he said that the federal government would get control of medicine unless physicians offered a better plan than the one now before congress.

Special Society Elections.—At recent meetings the following societies chose the officers indicated:

Virginia Obstetrical and Gynecological Society: Dr. Adrian L. Carson Jr., Richmond, president, Dr. Samuel E. Oglesby, Lynchburg, vice president and Dr. Lacy L. Shamburger, Richmond, secretary and treasurer.

Virginia Orthopedic Society: Dr. James B. Dalton, Richmond, president and Dr. James T. Tucker, Richmond, secretary.

Virginia Pediatric Society: Dr. Edwin A. Harper, Lynchburg, president, Dr. Robert B. Hightower, Alexandria, vice president and Dr. Emily Gardner, Richmond, secretary-treasurer.

Virginia Radiological Society: Dr. Clayton W. Eley, Norfolk, president, Dr. William P. Gilmer, Clifton Forge, vice president and Dr. Edward Latane Flanagan, Richmond, secretary-treasurer.

Virginia Urological Society: Dr. Thomas B. Washington, Richmond, president, Dr. Samuel A. Vest Jr., Charlottesville, vice president and Dr. Warren W. Koontz, Lynchburg, secretary-treasurer.

Virginia Section, American College of Physicians: Dr. Wyndham B. Blanton, Richmond, president and Dr. Alex F. Robertson Jr., Staunton, secretary-treasurer.

Dr. John Shelton Horsley, Richmond, was reelected president of the Virginia Cancer Foundation at its meeting in October. Dr. James R. Cash, Charlottesville, was named chairman of a committee on fellowship for cancer study.

WASHINGTON

Personal.—Dr. Percy S. Pelouze discussed gonorrhea before the Walla Walla Valley Medical Society, December 8.——Dr. Arthur L. Windom has resigned as superintendent of the King County Tuberculosis Hospital, Seattle.——Dr. Ralph L. Gregg, who concluded his internship at the King County Hospital, Seattle, January 1, has been appointed assistant superintendent of the hospital.

Hospital News.—It has been recommended that the Seattle City Hospital be abandoned and all city patients be treated at the King County Hospital, according to *Northwest Medicine*. The Public Safety Building, in which the city hospital is housed, is in poor condition and not suited for a modern hospital, it was stated. Clark General Hospital, Vancouver, was recently bequeathed $100,000.

HAWAII

Territorial Election.—Dr. Douglas B. Bell, Honolulu, was chosen president of the Hawaii Territorial Medical Association during its annual meeting in May. Other officers are Dr. Arthur V. H. Molyneux, secretary and Dr. Stewart E. Doolittle, treasurer, both of Honolulu. Vice presidents are Drs. Leo L. Sexton, Hilo, Nathaniel M. Benyas, Honolulu, Samuel R. Wallis, Lihue, and Katsuyuki Izumi, Wailuku.

New Public Health Appointments.—Dr. Richard K. C. Lee, Honolulu, since 1937 deputy territorial commissioner of public health, in July became director of public health, a newly created position. Dr. Lee graduated at Tulane University of Louisiana School of Medicine, New Orleans, in 1933 and received the degree of doctor of public health at Yale University in 1938. The *Hawaii Medical Journal* says that Dr. Lee is the only physician in the territory who could have qualified for the position under the recently repealed law which fixed the educational and experience qualifications for the leading position in Hawaii's public health organization. He has at various times served as acting director of the bureaus of maternal and child health, communicable diseases and tuberculosis and as acting territorial commissioner of public health. He has lectured on public health administration at the University of Hawaii annually since 1937. He holds a reserve commission in the U. S. Public Health Service.——Dr. Charles L. Wilbar Jr., Honolulu, became president and executive officer of the Territory of Hawaii Board of Health, June 25, following his release from the army. Dr. Wilbar graduated at the University of Pennsylvania School of Medicine, Philadelphia, in 1932 and served his residency in medicine at the Queen's Hospital, Honolulu. After his two years service as director of the bureau of maternal and child health of the territorial board of health he was given a leave of absence to study postgraduate training in pediatrics in Cincinnati. He went into active army service on Dec. 13, 1941, serving first as captain and later as major. His army service included an assignment as health officer for the county of Maui.

GENERAL

Examination in Otolaryngology.—The American Board of Otolaryngology will hold its next examination at the Waldorf-Astoria, New York, June 1-4. The meeting that was tentatively scheduled to be held in Los Angeles in February 1944 has been canceled. Dr. Dean M. Lierle, University Hospitals, Iowa City, is the secretary-treasurer of the board.

Pediatric Board Reopens Group I.—The American Board of Pediatrics at its recent annual meeting decided to reopen group I, which requires that an applicant shall have been specializing in pediatrics for ten years or more. Group I will be kept open until July 1. All candidates regardless of training or length of time in practice must take both the written and the oral examinations.

Committee on Professional Relations.—On December 2, Pan American Health Day, the American Public Health Association announced the appointment of a committee on professional relations with Latin America under the chairmanship of Louis I. Dublin, Ph.D., third vice president and statistician of the Metropolitan Life Insurance Company, New York. Other members of the committee are:

Robert S. Breed, Ph.D., chief, division of bacteriology, New York Agricultural Experiment Station, Geneva, N. Y.

Gordon M. Fair, C.E., professor of sanitary engineering, Harvard University, Cambridge, Mass.

Dr. Henry E. Meleney, Herman M. Biggs professor of preventive medicine, New York University College of Medicine, New York.

Nathan Sinai, D.P.H., professor of hygiene and public health, University of Michigan, Ann Arbor, Mich.

Dr. Ernest L. Stebbins, commissioner of health of New York City.

Clair E. Turner, Dr.P.H., professor of biology and public health, Massachusetts Institute of Technology, Cambridge.

Grants for Research in Endocrinology.—Requests to the National Research Council Committee for Research in Endocrinology for aid during the fiscal period from July 1, 1944 to June 30, 1945 will be received until Feb. 28, 1944. Application blanks may be obtained by addressing the division of medical sciences, National Research Council, 2101 Constitution Avenue, Washington, D. C. In addition to a statement of the problem and research plan or program, the committee desires information regarding the proposed method of attack, the institutional support of the investigation and the uses to be made of the sum requested. No part of any grant may be used by the recipient institution for administrative expenses. Applications for aid of endocrine research on problems of sex in the narrower sense cannot be given favorable consideration, but the committee will consider support of studies on the effects of sex hormones on nonsexual functions, for example on metabolism.

Fraudulent Representative of Manhattan Manufacturing Company.—The Manhattan Manufacturing Company of Chicago writes that an impostor has been soliciting orders in the name of the company, obtaining substantial deposits or full payments based on quick delivery or on unusually low prices. The name most frequently used is Mr. F. H. or A. H. Lancaster. The Manhattan Company states that every bona fide sales representative signs a bond application and that it does not now have nor ever had any one on its sales staff with this name or a similar one. The company states further that this impostor has sold bedding, towels, sheets and such items under its name even though it has never manufactured, handled, sold or had any catalogues illustrating such merchandise. The company suggests that a prospective purchaser observe that order books shown by the salesman contain the printed name of the company and that catalogues illustrate the indicated order bearing the same name as the order books. Customers should not pay any money on a blank form of an order on which the company's name is written by hand or rubber stamped. Instead the customer should offer to send the money directly to the company. The Manhattan Manufacturing Company regrets that this fraudulent representative has been mulcting the public and will appreciate any effort to apprehend him.

Wartime Strains Responsible for Increased Death Rate.—The increased death rate in the population of the United States in ages over 50 years during the last twelve months is a result of the greater strains and the frequent exposures to disease that are a part of wartime life, according to the Bureau of the Census, U. S. Department of Commerce, Washington, commenting on a special study recently concluded. The fact that a large number of older persons have returned to a strenuous working life after years of retirement certainly has played a part in the increase, it was stated. From 1940 through 1942 the death rates by age and race in the United States dropped gradually by amounts varying from 3.9 per cent to 11.1 per cent among the white and 5.9 per cent to 24.3 per cent among the nonwhite. In general the rates at the younger and older ages in both white and nonwhite declined more than the rates at the middle ages. However, when the returns from the bureau's 10 per cent mortality sample for the twelve month period ended September 1943 are compared with the final statistics for the calendar year 1942 it is seen that there have been significant increases in the white mortality at ages over 50 years. Every age group above that age has shown an increase, while at the ages below 50 the rates have remained practically stationary with the exception of the rate for ages under 5 years, which dropped 4.5 per cent in the period. The increases at the older ages ranged from 3.0 to 5.6 per cent. In the nonwhite group of the population the changes at ages over 50 years show a somewhat different pattern. Between 50 and 65 years and over 75 years the death rates increased, while between 65 and 75 they declined.

Sixth Annual Forum on Allergy.—The sixth annual forum on allergy will be held at the Statler Hotel, St. Louis, January 22-23. A feature of the meeting will be the presentation of the gold medal for outstanding contributions to clinical allergy to Dr. Robert A. Cooke, New York. Dr. Cooke will deliver the fourth annual forum lecture on "Observations on Allergic Reaction." Other speakers will include:

Roger P. Wodehouse, Ph.D., Yonkers, N. Y., Pollens in Hay Fever.
Dr. Edna S. Pennington, Nashville, Tenn., Allergy in the Older Housewife.
Dr. Alan G. Cazort, Little Rock, Ark., Critical Evaluation of Drugs Used in Treatment of Asthma.
Dr. Ethan A. Brown, Boston, Importance of Environmental Factors in the Management of the Allergic Patient.
Dr. Frederick W. Wittich, Minneapolis, Allergy to Fungi.
Dr. Milton B. Cohen, Cleveland, The Application of the Principles of Immunology to the Management of the Allergic Patient.
Dr. Elwood A. Sharp, Detroit; Endocrine Glands of the Allergic Patient.
Dr. Charles T. Eyermann, St. Louis, The Importance of Controlling During the Season of the Sensitization to Other Allegens: (*a*) Foods; (*b*) Other Inhalants.
Dr. Isidore S. Kahn, San Antonio, Texas, How Is the Specific Coseasonal Treatment Best Carried Out?
Dr. William P. Garver, Cleveland, Is Perennial Treatment Superior to the Preseasonal Method of Treatment?
Dr. Caryle B. Bohner, Indianapolis, What Is the Present Status of Oral Pollen Therapy?
Dr. Carliss M. Stroud, St. Louis, What Is the Optimum Dose of Pollen with Which to Approach the Season? Are Large Doses or Small Doses Advantageous Over the Moderately Sized Doses?
Dr. Abraham Colmes, Boston, Is There Any Advantage in Giving the Well Treated Patient Any Type of Pollen Therapy During the Season?
Dr. Samuel M. Feinberg, Chicago, What Is the Proper Specific Therapy in the Management of Pollen Asthma?
Dr. Karl D. Way Akron, How Can We Avoid Constitutional Reactions?
Dr. Ralph G. Mills, Decatur, Ill., Is There Any Advantage in Giving Vitamins and Minerals as Supplemental Feedings or as Drugs During the Hay Fever Season to the Hay Fever Patient?
Dr. Armand E. Cohen, Louisville, Ky., Are Nose Drops Beneficial or Harmful? If Prescribed, Which Ones?
Dr. James Harvey Black, Dallas, What Seasonal Precautions on the Part of the Patient Are of Practical Importance in the Management of a Case of Hay Fever?
Dr. Albert Kuntz, St. Louis, The Autonomic Nervous System and the Allergic Patient.
Dr. Harry L. Alexander, St. Louis, Treatment of Intractable Asthma.

A series of study groups will be conducted Saturday with the following physicians in charge:

Dr. Theodore L. Squier, Milwaukee, Allergic Manifestations in the Blood.
Dr. Herbert J. Rinkel, Kansas City, Mo., Food Allergy.
Dr. Cecil M. Kohn, Kansas City, Mo., Physical Allergy.
Dr. Stephan Epstein, Marshfield, Wis., Specific Treatment of Contact Dermatitis.
Dr. Stanley F. Hampton, University City, Mo., Conduct of Allergy Clinics.
Dr. Theron G. Randolph, Ann Arbor, Mich., Lymphocytes in Relation to Allergy Anaphylaxis and Immunity.
Dr. Orval R. Withers, Kansas City, Mo., Allergic Headaches.
Dr. French K. Hansel, St. Louis, Allergic Coryza.
Dr. Karl D. Figley, Toledo, Ohio, The Clinical Management of House Dust Sensitivity.
Dr. Ralph Bowen, Houston, Texas, Food Allergy in Children.
Dr. Fannie Lou B. Leney, Oklahoma City, Management of Asthma in Children.
Dr. Carroll M. Pounders, Oklahoma City, Vasomotor Rhinitis in Children.
Dr. Bernard G. Efron, New Orleans, Allergy Manifestations Without Positive Skin Tests.
Dr. George E. Rockwell, Cincinnati, Chemical Nature and Standardization of Pollen Antigen.
Dr. Russell J. Blattner, St. Louis, "Sulfa" Drugs and Hypersensitivity.

On January 21 the Association of Allergists for Mycological Investigation will meet with Dr. Homer E. Prince, Houston, presiding.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Nov. 20, 1943.

Medical Education in German Prison Camps

The work of the War Organization of the British Red Cross Society for prisoners of war in Germany includes provision of parcels of food and clothing and, among other things, an educational books section which enables the younger men whose education or training has been arrested to employ their enforced leisure with some profit. Many institutions and colleges have provided books on almost every subject and also courses of lectures. A scheme by which the prisoners can take examinations has been adopted with the permission of British and German authorities. Most of the English universities cooperate in this. Medical students who are prisoners are well cared for and have an advantage over other groups in that the camp medical officer is available for coaching. Camp medical officers have been provided with appropriate textbooks and schedules for coaching men up to the standard of the first M.B. examination. In one camp the education officer has procured locally a number of cats, earthworms and other animals for dissection. Theoretical examinations actually take place, monitors being appointed in the usual way and the papers are returned to the examiners in England. However, it is not possible to hold examinations involving practical work. One enthusiastic group has asked for a complete human skeleton and a set of microscopic slides illustrating normal histology. These are being specially prepared.

Subjects allied to medicine, such as first aid and home nursing, are also included, principally for the benefit of nursing and medical orderlies in the camps. Standard Red Cross handbooks and wall charts have been sent. Examinations are held by the medical officers, who declare the result and issue temporary certificates. These will be exchanged for official forms after the war. Prisoners are working for examinations in chiropody, massage and medical gymnastics. It is hoped to arrange for certain blinded prisoners, already advanced in their study of the practical side of massage, to be permitted to take some part of their examination.

A great initial difficulty was the arrangement for a room which could be kept silent and undisturbed for study and examinations. Energetic camp education officers requested and eventually got what they wanted from the German authorities. As the interest of prisoners grew, it became obvious not only that an interesting way of employing enforced leisure had been found but also that it would help the men with plans for their immediate future on their return to civilian life. At the same time the awful period of mental stagnation complained of by so many prisoners after the last war, which took months or even years to get over, will be avoided.

War Difficulties of Medical Publications

The shortage of paper due to the war has produced government control of its use. Medical journals, like other periodicals, are restricted to about half their prewar size, although during a large part of the war period the publication of medical books was not seriously affected. Recently the difficulties have increased because of a shortage of labor as well as of paper. There are difficulties in the issue of new medical books and new editions. A big publishing firm, established over a hundred years, whose medical and dental books are known all over the world, complains that it is compelled to refuse overseas orders every week because of exhaustion of editions and because paper is unobtainable for reprints, even though the type is still standing. When the paper controller gives permission for the production of a new edition he sometimes restricts the number of copies, thus increasing the price at which they can be sold. The *Nursing Times* declares that the work in training schools for nurses is hampered by lack of essential textbooks. Publishers are restricted to a certain proportion of their prewar consumption. Such restriction does not exist for firms established during the war. The result is, important publishers complain, that they cannot produce valuable books because of paper restriction, while mushroom firms which have just sprung up can publish rubbish. No one may start a new periodical or open a new book shop without a permit, but any one can start a new publishing business.

The *British Medical Journal* complains that medical journals of the highest standing, already shrunk beyond recognition, were in 1942 compelled to choose between cutting down circulation and further cutting down pages. In the case of the *British Medical Journal* there was no alternative, because membership gives a right to a weekly copy and the number of members has risen by 6,000 since the outbreak of war to a total well over 44,000. The present supply of paper of the *Journal* is totally inadequate for the needs of the profession, and much valuable information is delayed at a time when quick diffusion of new ideas is of first importance. Lay newspapers have lately been allowed a better ration of paper, but medical journals have not.

The Benefits of Graduated Sun Bathing on a Troopship

The Army Medical Department *Bulletin* describes an experiment in graduated sun bathing recently carried out on board a troopship during an outward voyage through the tropics. Sun bathing parades were incorporated into the training program and the skin of every man was inspected by a medical officer before and after each parade. Care was taken to include all men employed below deck, such as orderly room clerks and mess waiters. During the first few days no man was allowed to expose himself to the sun except on these parades, and the wearing of helmets in the open was compulsory. On parade the front and back of the body and limbs were exposed for ten minutes on the first three days, for twenty minutes on the next three days, and then for half an hour daily for a week. After this, men who were tanned were allowed to sun bathe independently during the evening. At the end of three weeks, when most of the parades were discontinued, the men were not allowed to wear more than shorts all day, and helmets were no longer compulsory.

Special attention was paid to any deviation from normal reaction. Men with slight erythema were excused from parade for one day; those with severe erythema were excused for three days. Those who tanned unusually slowly were grouped in a separate parade under a medical officer. It was found that few men seemed to be hypersensitive to the actinic rays of the sun and that exposure was inadvisable for men with seborrheic dermatitis. Men with blond skin required extra care.

The author of the experiment, the senior medical officer of the troopship reports the following satisfactory results: (1) improvement in general health (average daily sick parade 1.5 per cent), (2) diminution of such skin disorders as impetigo, acne, scabies, tinea pedis and prickly heat, (3) low incidence of sunburn (2 cases) and of heat stroke (none), (4) relief of heavy strain on laundry facilities and (5) accelerated rate of acclimatization on arrival in a tropical country. The officer commanding the troops, in a warm tribute, states that on landing in India the men were sufficiently inured to the sun to take the field at once, while returning troops, some of whom had been in India eight years, were white of skin, sensitive to the sun and unable to work on deck without shirts and helmets. He concludes "The results of this valuable experiment admit of no argument."

BUENOS AIRES

(From Our Regular Correspondent)

Nov. 1, 1943.

Medical Congresses

The second Inter-American Congress of Surgery and fifteenth Argentine Congress of Surgery took place in Buenos Aires October 11 to 15 with Dr. Oscar Capello presiding. There were fifty delegates from Pan American countries. Dr. Leo Eloesser of San Francisco was the delegate from the United States. The official topics were "Sulfonamide Therapy in Surgery," "Fractures of the Legs" and "Hyperthyroidism." Drs. Augusto A. Covaro, Enrique Lagomarsino, José Alberto Caeiro and Alejandro Ceballos, all of Buenos Aires, were official speakers. Dr. Lagomarsino based his article on personal observations of 1,143 fractures. He made special reference to the treatment of fractures, either closed or open and with or without complications. Special attention was directed to prevention and early therapy of gas gangrene and osteomyelitis in fractures. There were several sections on surgery, technical demonstrations of proctologic surgery and various specialties and a film on hydatidosis.

The first Inter-American Congress of Radiology was recently held in Buenos Aires. Dr. José F. Merlo Gómez presided.

Delegates to the congress resolved (1) to create an Inter-American College of Roentgenology in Buenos Aires, (2) to stimulate the creation of laws in Pan American countries to promote roentgenology and protect roentgenologists and (3) to provide for retirement of roentgenologists if they become victims of the practice of roentgenology.

At the close of the congress a monument in honor of Roentgen, Curie and the victims of roentgenology was unveiled in the Instituto Municipal de Radiología y Fisioterapia of Buenos Aires.

The fifth Argentine Congress of Obstetrics and Gynecology was recently held at the Faculty of Medicine of Buenos Aires. Dr. Frank R. Pasman was the president. The topics discussed were "Clinical Course and Treatment of Endometriosis," "Obstetric Endocrinology," "Treatment of Acute Puerperal Infection" and "Genital Hypoplasia."

Medical Week

The first Medical Week on the History of Medicine was recently held at the Instituto de Historia de la Medicina of the Faculty of Medicine of Buenos Aires. Dr. Juan Ramón Beltrán was the president. The following speakers gave lectures and read papers on official topics: Angel H. Roffo, Buenos Aires, "History of Cancerology"; Dardo Corvalan Mendilaharsu, Buenos Aires, "The Faculty of Medicine of Buenos Aires in the Epoc of Rosas"; Leo Eloesser, San Francisco, "Pirate and Buccaneer Surgeons"; Martin J. Becerra, Buenos Aires, "Edward Wilde's Generation"; Enrique de Gandia, Buenos Aires, "Origin of Syphilis in America"; Nicanor Palacios Costa, Buenos Aires, "Life and Work of Cosme Argerich"; Pablo Osvaldo Wolff, Buenos Aires, "Historical Aspect of Pharmacology," and José Arce, Buenos Aires, "Alejandro Posadas and His Work." There was also a special session on the history of pharmacy.

Poliomyelitis in 1942

The statistics of the Epidemiologic Department of the National Department of Hygiene show the following cases of poliomyelitis during the epidemic between October and December 1942: October 1 to 15, 4 cases; October 16 to 31, 11 cases; November 1 to 15, 38 cases; November 16 to 30, 117 cases; December 1 to 15, 146 cases, and December 16 to 31, 105 cases. There was a total of 421 patients in the period of three months; there were 406 cases among infants and 15 in children, adolescents and young adults. Two hundred and nine patients were boys and 196 were girls.

New Department of Public Health

A new National Department of Public Health and Social Assistance was created recently here. It includes the National Department of Hygiene, the Advisory Committee of Regional Hospitals, the National Institute of Nutrition, the Society of Beneficence of the Federal Capital, the National Centers of Social Assistance, the Department of Subsidies and all the national branches of the departments of Public Health and Hygiene. Dr. Eugenio A. Galli, mayor surgeon, R. A., was appointed president of the department. An honorary committee is carrying on some work looking toward incorporation in the new department of certain centers which are now branches of government departments. Dr. Galli suggested arrangements to give the benefits of social insurance to all Argentineans.

Syphilis

Dr. Francisco Gerardo Russo is the head of a large venereal disease dispensary in Buenos Aires. He says that syphilologists have found that syphilis has increased recently. One hundred and thirty-one cases of primary syphilis and 99 cases of secondary syphilis were reported to the National Department of Public Health between January and September 1942, and 205 cases of primary syphilis and 130 cases of secondary syphilis were reported for the same period of 1943. Syphilis diminished greatly for the years 1939 and 1940 after establishment of venereal disease laws. Dr. Russo believes that the fulfilment of these laws demands strict supervision.

Brief News

The Argentine Congress of Medicine and the Pan American Week on Neuropsychiatry for 1944 were postponed. The "Dr. Rafael A. Bullrich Prize" was recently established with a fund of $10,000, which was donated to the Academia Nacional de Medicina of Buenos Aires in homage to Dr. Bullrich, professor of clinical medicine of the Faculty of Medicine of Buenos Aires, who recently retired. The prize will consist of a gold medal, a diploma and a $600 award. It will be given every two years for the best article on cardiology published during the two year period.

A donation of $25,000 was recently given the Sociedad de Beneficencia of Buenos Aires for the construction of a pavilion for convalescents in one of the hospitals of the society.

The Hospital del Barrio Obrero was recently opened in Asunción, Paraguay. It was constructed with the cooperation of the Inter-American Service of Public Health.

The government of the United States offered a donation of $500,000 to Uruguay for improvements in public health. The offering was made through Dr. John D. Long of the Pan American Sanitary Bureau of Washington, who recently visited Uruguay. Uruguay will contribute an additional fund of $100,000 for the same purpose. The work on sanitation and public health in Uruguay will be carried on by American and Uruguayan specialized technicians.

Dr. Gonzalo Bosch was recently appointed regular professor of psychiatry of the Faculty of Medicine of Buenos Aires.

Marriages

HERMAN LAMAR SINGLETARY, Lake City, S. C., to Miss Martha Ann Newman of Charleston at Kingstree November 5.

MANNING LIONEL NELSON JR., North, S. C., to Miss Annie Elizabeth Howell of Ridgeway at Carlisle, Pa., August 14.

RICHARD COFFMAN SHRUM, Dayton, Va., to Miss Vennie Maureen Parrott of Florence in New York November 6.

JOHN SCOTT SHAFFER, Wytheville, Va., to Miss Amanda Elizabeth McKnelly at Petersburg October 23.

GEORGE L. LESLIE, Howell, Mich., to Miss Hazel Wood of Pontiac, Mich., in Carlisle, Pa., November 5.

Deaths

Ambrose Francis Dowd, Newark, N. J.; University of Vermont College of Medicine, Burlington, 1910; member of the Medical Society of New Jersey, American Psychiatric Association and the National Committee for Mental Hygiene; served as president of the New Jersey Neuropsychiatric Association; served overseas in the neuropsychiatric devision, medical corps, U. S. Army, during World War I; chairman of the medical advisory board of the Selective Service System; for many years member of the state board and department of institutions and agencies of control; consultant at the Irvington General Hospital, Irvington, St. Mary's Hospital, Orange, and the Presbyterian Hospital; on the staffs of the St. Michael's Hospital, St. James Hospital, Hospital and Home for Crippled Children and the American Legion Memorial Hospital; for two terms president of the medical staff of Hospital of St. Barnabas and for Women and Children; at one time medical director of the Newark City Hospital; died November 16, aged 56, of gastric ulcer.

George Franklin Shiels, Redwood City, Calif.; University of Edinburgh Faculty of Medicine, L.R.C.P. and L.R.C.S., Edinburgh, 1884; F.R.C.S., Edinburgh, Scotland, 1888; lecturer on medical jurisprudence, University of California, San Francisco, from 1890 to 1892 and professor of surgery from 1892 to 1898; professor of clinical surgery in the postgraduate department of the University of California from 1894 to 1898; assistant lecturer on surgery at the New York Polyclinic Medical School and Hospital from 1904 to 1906; professor of surgery at the Fordham University School of Medicine, New York, from 1905 to 1907; fellow of the American College of Surgeons; received medals and citations "for distinguished gallantry in action" during the Spanish-American War, the Philippine Insurrection and World War I; died in Palo Alto October 26, aged 80, of pneumonia.

Roy Parsons Forbes ⊕ Denver; Western Reserve University School of Medicine, Cleveland, 1915; associate professor of pediatrics at the University of Colorado School of Medicine; specialist certified by the American Board of Pediatrics, Inc.; member of the House of Delegates of the American Medical Association in 1931; past president of the Denver Public Health Council; formerly vice president of the Denver Tuberculosis Society and the Colorado Tuberculosis Association; member of the American Academy of Pediatrics; a captain in the medical corps of the U. S. Army during World War I; served on the staffs of the Children's Hospital, National Jewish Hospital and St. Anthony's Hospital; author of "Health Record for Children"; died November 8, aged 55, of cerebral hemorrhage, hypertension and chronic nephritis.

Frank Hall Washburn ⊕ Holden, Mass.; Tufts College Medical School, Boston, 1899; member of the American Society of Regional Anesthesia, Inc., American Urological Association, American College of Chest Physicians and the New England Roentgen Ray Society; fellow of the American College of Surgeons; chief of staff, Holden District Hospital, thoracic surgeon, Worcester County Sanatorium, Worcester, consulting surgeon, Rutland State Sanatorium, Rutland, and consultant in surgery and urology, Veterans Administration Facility, Rutland Heights; in 1931 delivered the George Washington Gay lecture at his alma mater; died in the New England Baptist Hospital, Boston, November 10, aged 72, of acute ileitis.

Willard John Stone ⊕ Pasadena, Calif.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1901; member of the House of Delegates of the American Medical Association in 1918; member of the American Society for Clinical Investigation; fellow of the American College of Physicians; clinical professor of medicine at the University of Southern California School of Medicine, Los Angeles; served as a major in the medical corps of the U. S. Army during World War I; on the staff of the Huntington Memorial Hospital; author of "Bright's Disease and Arterial Hypertension"; died October 30, aged 66, of coronary thrombosis.

Young Wilhoite Haley, Nashville, Tenn.; Vanderbilt University School of Medicine, Nashville, 1897; member of the Tennessee State Medical Association; formerly professor of physiology and professor of materia medica and therapeutics in the dental department of Vanderbilt University; at one time chairman of the governing board of the Nashville General Hosptal; formerly a member of the state examining board for nurses; for many years on the staff of St. Thomas Hospital; one of the founders and charter member of Protestant Hospital; died in Monteagle, Tenn., October 31, aged 69, of cerebral hemorrhage.

Allan Blanchard Stewart, Owatonna, Minn.; University of Minnesota College of Medicine and Surgery, Minneapolis, 1891; member of the Minnesota State Medical Association; at one time mayor; fellow of the American College of Surgeons; served during World War I; major, medical reserve corps, U. S. Army, not on active duty; for many years physician and surgeon for the Minnesota state public schools; on the staff of the Owatonna City Hospital; died in St. Mary's Hospital, Rochester, October 31, aged 80, of heart block and chronic nephritis.

John Samuel Abney, Jackson, Miss.; Memphis (Tenn.) Hospital Medical College, 1905; died November 27, aged 67, of acute dilatation of the heart.

John Calvin Anderson ⊕ Pittsburgh; University of Pittsburgh School of Medicine, 1913; specialist certified by the American Board of Otolaryngology; chief, nose and throat department, Columbia Hospital, Wilkinsburg; died in the Allegheny General Hospital November 13, aged 60, of bronchogenic carcinoma of the right lung with metastases to the cerebellum and pons.

Vandiver L. Bell, Grand Rapids, Mich.; Eclectic Medical Institute, Cincinnati, 1907; died November 20, aged 70, of heart disease.

Alexander J. Berger, Arkansas City, Kan.; Milwaukee Medical College, 1906; member of the Kansas Medical Society; served during World War I; on the staff of the State Hospital for Epileptics, Parsons; died November 2, aged 59, of carcinoma.

Charles Delos Bo Dine ⊕ Portland, Ore.; Northwestern University Medical School, Chicago, 1902; formerly assistant clinical professor of surgery at the University of Oregon Medical School; fellow of the American College of Surgeons; served during World War I; on the staff of the Emanuel Hospital, where he died October 18, aged 70, of injuries received in an automobile accident.

William Riley Brady, Seattle; University of Colorado School of Medicine, Denver, 1912; served during World War I; died in the Swedish Hospital, November 7, aged 59, of injuries received in an automobile accident.

Albert Franklin Brockman, Seattle; American Medical College, St. Louis, 1890; died October 10, aged 75, of coronary thrombosis.

George Spurgeon Bullock, Washington, D. C.; Meharry Medical College, Nashville, Tenn., 1938; died November 21, aged 31, in an automobile accident.

James Brandon Campbell ⊕ Big Rapids, Mich.; Saginaw Valley Medical College, Saginaw, 1900; past president of the Mecosta-Osceola Counties Medical Society; formerly city commissioner, mayor and member of the board of supervisors; served as a captain in the medical corps of the U. S. Army during World War I; a trustee of the Ferris Institute for many years; on the staff of the Community Hospital; local surgeon for the Pennsylvania Railroad; a director of Citizens State Bank; died November 13, aged 69, of coronary occlusion.

Samuel Davidson Carrigan, Sandoval, Ill.; St. Louis University School of Medicine, 1905; member of the Illinois State Medical Society; served as coroner of Marion County; died in St. Mary's Hospital, Centralia, November 12, aged 61, of cerebral hemorrhage.

Harry Ray Carson, Phoenix, Ariz.; Northwestern University Medical School, Chicago, 1909; specialist certified by the American Board of Pediatrics, Inc.; member of the Arizona State Medical Association, American Society of Anesthetists, Inc., and the American Academy of Pediatrics; served on the staffs of St. Joseph's and Good Samaritan hospitals; died November 8, aged 58, of hypertensive heart disease.

Marshall Grant Clancy, Chicago; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1900; served as police department surgeon; died November 28, aged 75, of heart disease.

John Marvin Davis, Red Bank, N. J.; University of the City of New York Medical Department, New York, 1887; for many years surgeon for the Furness Bermuda Steamship Line; died November 20, aged 77, of coronary disease.

Daniel Lee Dean, Hardinsburg, Ind.; Hospital College of Medicine, Louisville, Ky., 1903; died in Madison November 4, aged 78, of cerebral hemorrhage.

Richard L. Figgins, New Orleans; New Orleans University Medical College, 1907; died November 10, aged 53, of hemorrhage and shock from a self-inflicted gunshot wound.

Julius Mansfield Foster ⊕ Valley Stream, N. Y.; Long Island College Hospital, Brooklyn, 1899; school physician; one of the founders and vice president of the Valley Stream National Bank; died suddenly November 15, aged 68, of heart disease.

William Arthur Henderson, Kansas City, Mo.; Missouri Medical College, St. Louis, 1888; died November 18, aged 86, of cardiovascular disease and hypertension.

Alexander Ayer Higgs, San Diego, Calif.; Eclectic Medical Institute, Cincinnati, 1896; member of the House of Delegates of the American Medical Association in 1911; died September 10, aged 73, of cerebral hemorrhage and arteriosclerosis.

Pierre C. Hoag, Schenectady, N. Y.; Albany Medical College, 1878; died in the Ellis Hospital October 29, aged 90, of carcinoma of the prostate, hypertrophy of the prostate, uremia and chronic interstitial nephritis.

Adam Kemble ⊕ Washington, D. C.; George Washington University School of Medicine, Washington, 1905; member of the American Urological Association; also a pharmacist; served during World War I; a member of the board of regents of the Sibley Hospital; died in Mount Carmel, Pa., November 12, aged 65, of carcinoma.

Harry E. Thomas Kemper ⊕ Elizabeth, N. J.; Georgetown University School of Medicine, Washington, D. C., 1928; medical consultant on compensation court matters in the state; on the staffs of St. Elizabeth's Hospital and the Alexian Brothers Hospital, where he died October 18, aged 38, of coronary thrombosis and pulmonary embolism.

Gustavus A. Lusk, Ripley, Tenn.; Vanderbilt University School of Medicine, Nashville, 1881; died October 20, aged 88, of shock from a fractured hip.

Ernest Everest Martin, Allen, Ky.; University of Louisville School of Medicine, 1925; on the staff of the Martin General Hospital, Martin; died October 21, aged 43, of a fractured skull received in a fall.

Thomas Addison McCann, Dayton, Ohio; Hahnemann Medical College and Hospital of Philadelphia, 1891; formerly a member and president of the Ohio State Medical Board; for many years chief of staff, Miami Valley Hospital; died November 7, aged 84, of carcinoma of the prostate.

George Sheppard Moore, Nashville, Tenn.; Northwestern University Medical School, Chicago, 1910; clinical director of the Veterans Administration Facility, Tuskegee, Ala., from 1924 to 1937; died in the George W. Hubbard Hospital of Meharry Medical College October 28, aged 60, of acute peritonitis due to peptic ulcer.

Charles Francis Morris, Oteen, N. C.; Indiana University School of Medicine, Indianapolis, 1909; served during World War I; on the staff of the Veterans Administration Facility; died in an Asheville hospital October 30, aged 60, of injuries received in an automobile accident.

Lewis Burrows Morton ⊕ Los Angeles; State University of Iowa College of Medicine, Iowa City, 1901; specialist certified by the American Board of Surgery; member of the Western Surgical Association and the Pacific Coast Surgical Association; fellow of the American College of Surgeons; served as president of the staff and for many years a member of the surgical staff of St. Vincent's Hospital; died October 19, aged 65, of carcinoma of the sigmoid colon with metastases to the liver.

John Francis Nelson, New York; Columbia University College of Physicians and Surgeons, New York, 1905; assistant clinical professor of surgery at the New York University College of Medicine; member of the Medical Society of the State of New York; died September 30, aged 62, of heart disease.

Harry G. Nickel, Boiling Springs, Pa.; Baltimore Medical College, 1898; member of the Medical Society of the State of Pennsylvania; on the associate staff of the Carlisle Hospital, Carlisle, where he died October 28, aged 70, of coronary occlusion.

George Washington Nihart, Petoskey, Mich.; Rush Medical College, Chicago, 1883; past president and secretary of the Emmet County Medical Society; at one time mayor of Mendon; for many years county coroner and city health officer; died October 16, aged 87, as the result of a fractured hip received in a fall.

Aloysius E. O'Flaherty, Los Angeles; Kansas City (Mo.) Medical College, 1898; on the staff of St. John's Hospital, Santa Monica, Calif.; at one time on the staff of the Soldiers' Home Hospital, Soldiers Home, Calif.; died October 7, aged 71, of intestinal obstruction.

Bert R. Parsons ⊕ Cortland, N. Y.; Eclectic Medical Institute, Cincinnati, 1899; treasurer of the Medical Society of the County of Cortland; chief of the obstetric service, Cortland County Hospital; died November 4, aged 71, of coronary occlusion.

William George Pullen, Corrigan, Texas; Memphis (Tenn.) Hospital Medical College, 1903; member of the State Medical Association of Texas; president of the Polk County Medical Society in 1931; served as health officer of Corrigan; a member of the Lions Club and a director of the Citizens State Bank; died recently, aged 75, of cerebral hemorrhage.

George D. Ruthven, Rochester, N. Y.; Trinity Medical College, Toronto, Ont., Canada, 1895; aged 74; died recently of bronchopneumonia.

William Alfred Shoemaker ⊕ St. Louis; University of Maryland School of Medicine, Baltimore, 1885; an Affiliate Fellow of the American Medical Association; member of the American Academy of Ophthalmology and Otolaryngology; fellow of the American College of Surgeons; formerly clinical professor of ophthalmology at the Washington University School of Medicine; consulting ophthalmologist, Evangelical Deaconess Hospital; died November 7, aged 83, of coronary thrombosis.

Lester Eugene Siemon, Cleveland; Cleveland University of Medicine and Surgery, 1896; formerly a member of the Ohio State Medical Board; at one time on the staff of the City Hospital; died in Tionesta, Pa., October 3, aged 75, of a self-inflicted bullet wound.

Frank Floyd Wagoner ⊕ Chicago; Rush Medical College, Chicago, 1925; on the staff of the Norwegian American Hospital, where he died November 3, aged 48, of heart disease.

DIED WHILE IN MILITARY SERVICE

Clarence Pennell Baxter, San Diego, Calif.; Tufts College Medical School, Boston, 1914; Army Medical School, 1917; member of the California Medical Association; commissioned a first lieutenant in the medical corps of the U. S. Army on Jan. 20, 1917 and promoted to the grade of major on March 28, 1918; honorably discharged on June 30, 1922; appointed a lieutenant colonel in the Officers' Reserve Corps on Jan. 12, 1925 and served as contract surgeon from September 1935 to January 1937; returned to active duty with the medical corps, Army of the United States, on Oct. 10, 1940 and assigned to the Canal Zone, where he died April 27, aged 52, of gangrene.

David Clithero, Los Angeles; College of Medical Evangelists, Loma Linda and Los Angeles, 1940; commissioned a first lieutenant, medical corps, Army of the United States, on Aug. 18, 1942; died in Clovis, N. M., August 22, aged 32.

Edmund Francis Corrigan, St. Paul; University of Minnesota Medical School, Minneapolis, 1940; served on the resident staff of the City of Detroit Receiving Hospital; commissioned a lieutenant (jg) in the medical corps of the U. S. Naval Reserve on July 7, 1942; died in the U. S. Naval Hospital, Seattle, February 16, aged 27, of Hodgkin's disease.

Frederic Francis De Metrovich ⊕ Fowler, Colo.; University of Colorado School of Medicine, Denver, 1934; member of the Illinois State Medical Society; specialist certified by the American Board of Pediatrics, Inc.; formerly instructor in pediatrics at the Northwestern University Medical School and on the staff of the Children's Memorial Hospital, Chicago; captain, medical corps, Army of the United States; died in the Southwest Pacific area November 21, aged 35, of malaria.

Paul Churchill Johnson, Montoursville, Pa.; Jefferson Medical College of Philadelphia, 1940; member of the Medical Society of the State of Pennsylvania; commissioned a first lieutenant in the medical corps, Army of the United States, on Sept. 9, 1942; died in Hazard, Ky., August 14, aged 28, in an aircraft accident.

Bernard Jay Rike, Pueblo, Colo.; University of Colorado School of Medicine, Denver, 1939; commissioned a first lieutenant in the medical reserve corps, U. S. Army, on May 29, 1939 and promoted to captain on Nov. 22, 1942; died in the Southwest Pacific January 7, aged 29, of typhus.

Bureau of Investigation

DANGEROUS TO HEALTH

When Used as Directed

[EDITORIAL NOTE.—These abstracts concern preparations which were specifically declared by the Food and Drug Administration of the Federal Security Agency to be dangerous when used in accordance with the directions given on the label by the manufacturer. The abstracts that follow are given in the briefest possible form: (1) the name of the product; (2) the name of the manufacturer, shipper or consigner; (3) the date of shipment; (4) the composition; (5) the type of nostrum; (6) the reason for the charge of misbranding, and (7) the date of issuance of the Notice of Judgment.]

Goodwin's Laxative Cold Tablets and No. 48511-C Tablets.—Shipped in February and March 1941 by Sharp & Dohme, Philadelphia, as No. 48511-C Tablets to Read Drug and Chemical Company, Baltimore, and repackaged by them as Goodwin's Laxative Cold Tablets. Composition: in each tablet acetanilid (approximately 2 grains), quinine sulfate (¼ grain), podophyllin, capsicum and extract of belladonna. Repackaged tablets misbranded because dangerous to health when used in dosage and with frequency and duration suggested in labeling; further misbranded because terms "Goodwin's Laxative Cold Tablets" and "Effective in the Treatment of Colds. Relieves the Feverish Conditions which Accompany Colds" and "Keeps the Bowels Active" gave false impression that product was an effective treatment for colds. Also misbranded because amount of belladonna alkaloids present was not properly declared on label. Again misbranded because label did not adequately warn against use by children or in those pathologic conditions wherein it might be dangerous to health or caution against unsafe dosage and duration of administration, since label gave no warning that use should be discontinued if a skin rash appeared, or that tablets should be used cautiously if dryness of throat occurred; that they should be discontinued if rapid pulse or blurring of the vision resulted; that they should not be taken by children; that frequent or continued use might be dangerous to health by causing serious blood disturbances, anemia, collapse, or dependence on the drug; that the preparation should not be taken by elderly persons except on competent advice; that frequent use might lead to dependence on laxatives to move the bowels, and (in the case of the bulk tablets) labeling did not warn against use of these tablets in the presence of abdominal pain, nausea, vomiting or other symptoms of appendicitis.—[*D. D. N. J., F. D. C. 659; February 1943.*]

Interferin.—Keefer Laboratories, Chicago. Shipped Nov. 3 and 27, 1941. Composition (expressed in percentages): essentially potassium soap (approximately 11.3), sodium soap (approximately 12.5), potassium iodide (approximately 6), benzoic acid (0.4), fats and/or oils (0.4), alcohol and water. Adulterated because quality fell below that purported, since product was offered for use by injection into the uterus, thereby implying that it was sterile, whereas it was contaminated with viable bacteria of a disease-producing type. Misbranded because dangerous to health when used in dosage and with frequency and duration suggested in leaflet accompanying carton, as an abortifacient. Further misbranded because of label representation that product had proved its value in more than 5,000 cases without a single known fatality; that it had been developed after extensive research, offered very definite advantages over old methods and was efficacious and appropriate for several ovarian complications, as well as syphilis, blood, skin, kidney and cardiac ailments and tuberculosis of the lungs, endocrine disorders, organic and functional nervous system diseases, blindness and other eye conditions, ear troubles, caries, hereditary diseases such as insanity and epilepsy, and some other things.—[*D. D. N. J., F. D. C. 657; February 1943.*]

Lambert's Powders.—Stanley Drug Company, Minneapolis. Shipped July 19, 1940. Composition: each powder contained 2½ grains of acetanilid and salol, and 5 grains of aspirin. Misbranded because dangerous to health when used in the dosage or with the frequency or duration recommended in the labeling. Further misbranded because labeling failed to bear adequate warning that giving the product to children might be dangerous to health, or caution against unsafe dosage or methods or duration of administration, since labeling did not warn that frequent or continuous use of a product containing 2½ grains of acetanilid per powder might cause serious blood disturbances, anemia, collapse, or a dependence on the drug. Further misbranded because statement on carton, "muscular aches and body pains, lumbago" was false and misleading, since it represented that the drug was efficacious in the treatment of such conditions, whereas it was not.—[*D. D. N. J., F. D. C. 702; April 1943.*]

Voltamp Battery No. 7.—Voltamp Electric Manufacturing Company, Baltimore. Shipped April 25, 1941. A device containing batteries, an electric coil, and attachments for applying electric current to the body. Misbranded because dangerous to health when used with frequency or duration suggested in labeling for a long list of disorders, including aphasia, apoplexy, Bell's palsy, bladder paralysis, blindness, catalepsy, muscular cramps, poliomyelitis, tetanus, spinal meningitis, neuritis, baldness, cataract, menstrual troubles, anemia, dropsy, cystitis, corns, Bright's disease, St. Vitus' dance, diabetes, diphtheria, exophthalmic goiter, obesity, tonsillitis and varicose veins; that it would increase the supply of mother's milk, remove superfluous hair, rid the skin of blemishes, develop the bust and other shrunken parts, and permanently relieve constipation.—[*D. D. N. J., F. D. C. 658; February 1943.*]

Correspondence

THE 9-9-9 PLAN FOR INTERNSHIPS AND RESIDENCIES

To the Editor:—The medical services of the Army and Navy are justly proud of the superb health record of our armed forces and of the even more remarkably low mortality rate in wounded soldiers and sailors. Part of this magnificent performance is due, of course, to the efficient organization of the medical services of the armed forces. A large share has resulted from the advances in medical knowledge of the past twenty-five years. It seems probable, however, that the major element in the achievements of the military medical services is the high standard of medical education in this country during the past quarter century. The doctors now serving the nation in a military capacity are almost all graduates of modern schools and many have had excellent opportunities for postgraduate education. Unless the men coming into active service know the fundamental principles of medicine, have been taught to keep abreast of advancing knowledge and by arduous and prolonged training have learned the application of their knowledge, the great advances in medicine and excellent organization cannot produce the efficient medical service which is being given to our armed forces at the present time.

The Army, the Navy and the country itself owe a large debt to the medical educators of the past twenty-five years, and particularly to those educators who have served on the Council on Medical Education and Hospitals of the American Medical Association. It is therefore disturbing to find that the Council has given its support to the promulgation of the so-called 9-9-9 plan for hospital internships and residencies. This action appeals to many medical educators as a real disservice to the armed forces. An opinion so diametrically opposed to that of the general staffs of the Army and Navy should not be expressed without good reasons.

In contrast to the finely trained personnel of the present armed services, it will not be long before the medical schools and hospitals are delivering to the Army and Navy men of a different stamp. They will be medical graduates who have seen nothing but hurried, incomplete, perhaps even at times ill advised medical service. A competent resident staff is not only a matter of numbers. There are also involved matters of training and experience. A resident of but eighteen months of training can in no sense set the example that a resident of three to five years of previous experience can set. Nor can he teach. Without adequate resident staffs, accurate and complete histories and physical examinations, close and careful observation of patients, conscientious supervision of student progress and the example of technical procedures carried out by men who know how cannot be preserved. The elaborate rituals of present day medicine are designed for the safety of the patient; but a second purpose of equal if not greater importance in teaching hospitals is to demonstrate to the medical student work well done. Without trained assistants in adequate numbers the good precepts of the classrooms will be more than offset by the much more impressive but unavoidable bad practice at the bedside. The frantically busy teacher cannot add to his increasing burden the task once borne by the thoroughly trained resident of teaching the student the details of patient care.

We are not alone in the conviction that undergraduates educated under the 9-9-9 program cannot be anything but poorly trained doctors with no real background for medical growth through the years. When the Army and the Navy get these men who have not been exposed to good example and for whom there has been no time for reflection, contemplation, reading, maturing, how long will the splendid military medical record stand? If this war ends shortly, much harm will be done, and if the war lasts long the results will be irremediable.

There would be no purpose in such sentiments as these unless a feasible alternative course could be seen. This communication is written in the firm conviction that, for the sake of ultimate victory and an America worth saving, the quality of medical education should be given top priority among those peacetime traditions to be preserved; and medical education is now seriously threatened.

Let us inquire what gains the armed forces are making at such cost. On Jan. 1, 1944 a group of young physicians will become available from the teaching hospitals for military service. It is hard for the outsider to estimate how many of these there will be who would not otherwise then enter the Army or Navy. Since there are only seventy-seven medical schools in this country, and since only a minor though important part of the house staffs from the teaching hospitals is being prematurely released, an estimate of the immediate increment to the Army and Navy would be 500 men. Since hospitals generally have already pared their staffs to a low figure, the number might be less. Compare these figures with the present military medical roster of perhaps 50,000. The additional immediate strengthening of the military services is obviously proportionally minute, at the outside probably not more than 1 per cent. Furthermore, this is only an immediate gain. No greater number of men will be available on Jan. 1, 1945 and later than would have been available if the 9-9-9 plan had not been imposed on teaching hospitals.

The preservation of trained house staffs in the teaching hospitals would make possible a passable education for undergraduate students in spite of the accelerated program and would furnish from the house staffs a leaven of well trained men for replacement in the armed services. These two things alone would pay dividends to the Army and Navy beyond computation. It would seem an elementary proposition that these compensations would enormously outweigh the relatively insignificant immediate gains.

No doubt the Council on Medical Education has considered the propositions made herein and has made its decision on well grounded reasons. Many conscientious medical educators would like a frank presentation from the Council of those reasons.

If nothing can be done to improve the present situation, the medical profession can be assured that its teachers will endeavor to do the best job they can in spite of almost insuperable handicaps to good teaching.

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Professor of Surgery, Medical College of Virginia

EVARTS GRAHAM, M.D.
Professor of Surgery, Washington University Medical School

ALFRED BLALOCK, M.D.
Professor of Surgery, Johns Hopkins University School of Medicine

EDWIN P. LEHMAN, M.D.
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BARNEY BROOKS, M.D.
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JOHN J. MORTON, M.D.
Professor of Surgery, University of Rochester School of Medicine and Dentistry

FREDERICK A. COLLER, M.D.
Professor of Surgery, University of Michigan Medical School

[This statement was referred to the Council on Medical Education and Hospitals. The Council comments:]

To the Editor:—Every one interested in high standards of medical education and medical service both in the armed forces and in civilian practice shares with the correspondents their great concern over the wartime training of doctors. Curtailment of staff has multiplied the difficulties for remaining teachers. Uncertainty of the future has adversely affected student morale. A 30 per cent increase in annual medical school admissions and graduates has meant acceptance of some students whose qualifications may be open to question.

On purely educational grounds, it would be impossible to defend a nine month internship, which must be regarded as a wartime educational casualty. Reluctantly, and only after carefull consideration of the advantages and disadvantages and weighing the possible alternatives, the Council has recognized the so-called 9-9-9 plan as the best available under present wartime conditions.

The plan conserves medical manpower for both military and civilian use. Each year approximately 7,000 men graduate from medical school under the accelerated program. Under the old plan, three months of their internships would overlap with the internships of the next class. The quality of instruction in the overlapping period was often inferior, adding considerably less than the equivalent of three months' time to the nine month non-overlapping period. On the other hand, under the 9-9-9 program about 3,000 of these men will be available three months early each year, or the equivalent of 750 physician-years annually. Seven hundred and fifty physicians represents the complement of medical officers for approximately 125,000 new troops.

The 9-9-9 program assures the deferment of assistant residents and residents, even though the period of additional training is less than the three or more years generally considered desirable, and readily attainable in peacetime.

The Council's opinion that the 9-9-9 program is the best that can be obtained under the circumstances is not "diametrically opposed to that of the general staffs of the Army and Navy." The 9-9-9 program was the only method of deferment of commissioned officers as assistant residents and residents on which agreement could be reached. If a one year internship was to be continued, hospitals would be forced to operate without any commissioned officers deferred as residents. It is better to have one third of the intern group continue for nine months as assistant residents and one sixth of the group for a second nine months as residents than to have no deferments for hospital service after the first year of internships. The latter was apparently the only alternative and was considered to be less desirable than the 9-9-9 program.

No one would differ with the educational principles pronounced by the correspondents. In wartime, educational standards must be preserved with but one qualification. There must also be a maximal contribution by medical education to winning the war. That contribution has already been and will continue to be of inestimable value, thanks to the efforts of teaching staffs operating under almost insurmountable difficulties.

REACTIONS AFTER SPINAL ANESTHESIA

To the Editor:—The editorial in THE JOURNAL, Oct. 9, 1943 entitled "Reactions After Spinal Puncture" interests me because of such reactions in connection with spinal anesthesia. These reactions, while rare of late years, after some considerable experience with spinal anesthesia are attributed by me primarily to an atraumatic puncture with a 20 gage spinal needle. The possible theories of the mechanism of these headaches is interesting but still largely academic.

Of only empirical value in their treatment but nonetheless immediate in alleviation of these headaches is the slow intravenous injection of 7½ grains (0.5 Gm.) of caffeine with sodium benzoate. One such injection results in complete cessation; rarely a second or third injection may be necessary at six hour intervals. There have never been any untoward reactions from this therapy in quite a number so treated for the past fifteen years.

This observation was reported by me some years ago in an article on spinal anesthesia published in the *American Journal of Obstetrics and Gynecology*. However, experience in the Army indicates that it is not generally known and was not mentioned in the editorial. I have inquired of several pharma-

cologists and physiologists as to the possible explanation of the action of caffeine with sodium benzoate without enlightenment.

An interesting companion article in this connection appears in the abstract section of the same issue of THE JOURNAL entitled "Caffeine Withdrawal Headaches," by Dreisbach and Pfeiffer (*J. Lab. & Clin. Med.* **28**:1212 [July] 1943, abstr. THE JOURNAL, Oct. 9, 1943, p. 382).

HALL G. HOLDER, Lieutenant Colonel, M. C., A. U. S.

EMERGENCY MATERNAL AND INFANT CARE PLAN FOR WIVES AND CHILDREN OF ENLISTED MEN

To the Editor:—The widespread dissatisfaction with the management of the emergency maternal infant care plan for wives and babies of men in the armed forces by representatives of the Children's Bureau emphasizes the need for a committee, nationwide in scope and representation, to meet with government bureaus when they have to administer medical care programs. Could not the Council on Medical Service and Public Relations call together representatives of the various state medical societies and departments of public health to consider policies to be followed in the administration of such plans? Such a committee could offer its cooperation to the persons or bureau responsible for the administration of the program. If necessary, the committee could offer uniform nationwide opposition to ill considered schemes that might be put forward by the bureau. It would be difficult for any bureaucrat to ignore such a committee. Points of difference, if any arise, could be ironed out in friendly conference instead of by the present cumbersome plan of having each state fight its own battle without being too familiar with the feeling of the profession in other states. By offering such cooperation—and, if necessary, opposition—needlessly irksome regulations could be avoided. The profession could better protect the health and interests of those the law was designed to serve as well as its own interests. By the same maneuvers it could avoid the oft voiced criticism that the profession never offers anything but opposition to medical care programs.

JAMES H. HUTTON, M.D., Chicago.

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

BOARDS OF MEDICAL EXAMINERS
BOARDS OF EXAMINERS IN THE BASIC SCIENCES

Examinations of boards of medical examiners and boards of examiners in the basic sciences were published in THE JOURNAL, Dec. 25, page 1137.

NATIONAL BOARD OF MEDICAL EXAMINERS

NATIONAL BOARD OF MEDICAL EXAMINERS: *Parts I and II.* Jan. 17-19. *Part III.* Various centers, January. Sec., Dr. J. S. Rodman, 225 S. 15th St., Philadelphia.

EXAMINING BOARDS IN SPECIALTIES

AMERICAN BOARD OF ANESTHESIOLOGY: *Oral. Part II.* Chicago, June 12-16. Final date for filing application is March 12. Sec., Dr. Paul M. Wood, 745 Fifth Ave., New York.

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY: *Written,* Various large cities, May 8. *Oral.* Chicago, June 9-10. Final date for filing application is April 1. Sec., Dr. C. Guy Lane, 416 Marlboro St., Boston.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY: *Part II.* May or June. Sec., Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh 6, Pa.

AMERICAN BOARD OF OPHTHALMOLOGY: Chicago, October. Sec., Dr. John Green, 6830 Waterman Ave., St. Louis.

AMERICAN BOARD OF ORTHOPAEDIC SURGERY: *Written and Oral. Part II.* Chicago, Jan. 21-22. Sec., Dr. Guy A. Caldwell, 3503 Prytania St., New Orleans, La.

AMERICAN BOARD OF OTOLARYNGOLOGY: *Oral.* New York City, June 1-4. Sec., Dr. Dean M. Lierle, University Hospitals, Iowa City, Ia.

AMERICAN BOARD OF PEDIATRICS: *Written.* Locally, Feb. 4. *Oral.* Philadelphia, March 25-26, and San Francisco, May 6-7. Sec., Dr. C. A. Aldrich, 707 Fullerton Ave., Chicago.

AMERICAN BOARD OF SURGERY: *Written. Part I.* March 10. Final date for filing application is Jan. 1. Sec., Dr. J. Stewart Rodman, 225 S. 15th St., Philadelphia.

AMERICAN BOARD OF UROLOGY: *Oral.* Chicago, Feb. 15-17. Sec., Dr. Gilbert J. Thomas, 1409 Willow St., Minneapolis.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Hospitals: Property of Not for Profit Corporation Operated for Benefit of Individual Physicians Not Exempt from Taxation.—A Wisconsin statute provides exemption from taxation with respect to the property of any benevolent association used exclusively for the purposes of such association and which is not leased or otherwise used for pecuniary profit (Wisconsin Stats., sec. 70.11 [4]). This statute, the Supreme Court of Wisconsin held in two recent cases, *Prairie du Chien Sanitarium Co., Inc.* v. *City of Prairie du Chien,* 7 N. W. (2d) 832 and *Riverview Hospital* v. *City of Tomahawk,* 11 N. W. (2d) 188, does not grant tax exemption to a nonprofit hospital corporation to which has been conveyed a hospital previously operated for profit, where the hospital under the new corporate setup is used primarily for the greater profit and convenience of the physician that built and originally owned the hospital even though the hospital accepts all patients who apply regardless of their ability to pay and operates at a deficit, which is made good by the physician referred to.

In the Prairie du Chien Sanitarium case the Prairie du Chien Sanitarium Company, Inc., was a successor corporation to a private corporation for profit and had conveyed to it a hospital previously owned by the corporation for profit. The members of the new corporation were Dr. and Mrs. Satter, Dr. Dessloch, a layman who acted as the business manager of the hospital, and three relatives of the Satters, who paid nothing for their membership. Drs. Satter and Dessloch by agreement with the new corporation had the exclusive right to perform surgery in the hospital. These physicians received no salaries from the hospital but were provided without cost with heated, unfurnished offices in the hospital, rent free, and one meal a day. In return they supervised without compensation the hospital and its personnel. About 30 per cent of the total number of cases treated in the hospital were county and municipal patients whom the hospital cared for under contract for less than cost. These patients were treated by Drs. Satter and Dessloch without charge. The other patients in the hospital were private patients of the two physicians and other physicians, who were charged regular rates, though about 10 per cent of the total number of all accounts were not collected, apparently because of inability on the part of the hospital to collect. The hospital corporation contended that its property was exempt from local taxation in a suit it instituted against the city of Prairie du Chien to recover taxes paid under protest. The trial court dismissed the complaint, and the hospital appealed to the Supreme Court of Wisconsin.

In view of the statute referred to relating to tax exemption, said the Supreme Court of Wisconsin, for the hospital's contention to be sustained it must appear that (1) the hospital is a benevolent association (2) the personal property of which is used exclusively for the purposes of the association and (3) the real and personal property of which is not used for pecuniary profit. The court then discussed tests to be applied to determine what constitutes a hospital a benevolent association. It is clear, said the court, that the fact that the articles of incorporation provide that the institution is benevolent and charitable is not controlling. The actual financial setup of the hospital is important. If the books of the corporation show a substantial profit, this is a circumstance tending to negative the idea of a benevolent institution. The fact that the hospital receives and is dependent on donations indicates a benevolent character, as does the fact that it takes all patients who apply, regardless of their ability to pay, or at least that it does take a fair number of charity patients. A final and most important test is whether the members of the corporation render services without compensation. Obviously neither a single test nor isolated answers to each of the questions posed will automatically determine when

a hospital is a benevolent association. The facts of each case must be regarded as a whole, and the substance of the scheme of operation as it exists must be examined.

The Prairie du Chien Sanitarium operated for the fiscal year ended March 31, 1941 at a loss of about $388. It received donations from the members of the corporation only. Such donations, said the court, do not make a hospital a benevolent association. *Rogers Memorial Sanitarium* v. *Summit*, 228 Wis. 507, 279 N. W. 623. In the present case the individual physicians were making from $7,500 to $10,000 a year. The manager, another member of the corporation, was paid a salary of $140 a month. The hospital alleged that it took all patients who applied, but so far as the record shows, said the court, the 10 per cent of the patients whose accounts were not collected and who were classified as neither private nor county patients were billed for regular charges and everything was done to collect these bills. The chief point relied on by the hospital to establish the benevolent character was that the physicians in charge of the hospital were not paid any salaries for their services as medical directors of the hospital or for the operations they performed on county patients and those patients who came to the hospital without their own physicians. Whether it is exact, answered the Supreme Court, to say that these physicians received no compensation for their services is doubtful. They received their offices in the hospital rent free as well as the use of the hospital facilities and one meal a day. Whether or not the compensation was of value equivalent to the services rendered, it is clear that there is not a complete absence of remuneration such as is found in the cases in which all the work in the hospital except medical services is performed by the members of a religious order.

This leads us, continued the court, to the second and third points as to whether or not the property is used exclusively for the purposes of the hospital corporation and whether it is used for pecuniary profit. A corporation claiming to be benevolent to qualify its property for exemption from taxation must use it so free from connection with profits accruing to those owning it as clearly to be a charitable institution. Hence the personal property, grounds and buildings of a hospital are not exempt when members of the owner association are using the hospital as an adjunct to their private practice in such a way that it becomes a source of substantial help in the matter of earnings to be derived from the practice of their profession. It seems clear that even if we assume that the hospital is a benevolent association the property is used as much to advance the individual fortunes of the surgeons who manage it as it is for charitable purposes. There can be little doubt that the hospital is maintained primarily for the greater convenience and profit of these physicians in the practice of their profession. The physicians may, and under their management and control of the hospital did, give without recovering pay therefor of their time and skill in caring for people who did not pay for such care, but by reason of the use of the hospital in relation to their private practice the benefits extended were those of the physicians and not a contribution to public welfare by a benevolent association. The Supreme Court accordingly held that the property of the hospital was subject to local taxation.

As has been indicated, a similar result was also reached in the Riverview Hospital case. In that case Dr. Henderson established and operated a hospital in Tomahawk. Later for a nominal consideration he conveyed the hospital property to a corporation organized as a nonstock, nonprofit corporation. The members of the newly formed corporation were Dr. Henderson, his wife and Dr. MacFarlane, a dentist and a friend of Dr. Henderson. In the articles of incorporation of the new corporation it was provided that members of the corporation were to receive no dividends or any pecuniary profit, and all profits, if any, were to be used solely in increasing the facilities of the hospital and in the reduction of rates. The hospital received all persons applying for admission without first making inquiry as to their ability to pay. In 1940 it operated at a loss of around $3,000, which was made good by Dr. Henderson. The hospital corporation instituted action against the city of Tomahawk to recover taxes paid on its property under protest, and from a judgment in favor of the hospital corporation the city of Tomahawk appealed to the Supreme Court of Wisconsin, which held the hospital corporation liable for taxation on the broad grounds advanced in the Prairie du Chien case.

While the setup in the Riverview Hospital case, the Supreme Court pointed out, was somewhat different than in the Prairie du Chien case, still the surrounding circumstances showing purpose, management and connection with private enterprise was such that the hospital was under the rule recognized in the Prairie du Chien case that "an association or corporation claiming to be benevolent, in order to qualify its property for exemption from taxation, must use it so free from connection with profits accruing to those owning it as clearly to be a charitable institution." The property of a hospital corporation, said the court, is not exempt from taxation when members of the owner organization are using it as "an adjunct to their private business in such a way that it becomes a substantial help in the matter of earnings to be derived from the practice of their profession." All that was said in the Prairie du Chien case covering the use made of the hospital by its owner and his control over it appeared in the Riverview Hospital case although in the latter case the hospital did not specifically grant to Dr. Henderson exclusive use of the operating room and provide for meals. However that may be, there was no doubt that the hospital was conducted and managed primarily for the greater income and profit of Dr. Henderson in the practice of his profession. The evidence showed that Dr. Henderson, owing to differences arising between himself and the only other hospital in Tomahawk, was without hospital facilities and he organized the Riverview Hospital, giving it the property involved. A charge was made for every patient entering the hospital, and every means was used to effect collection. At the time the corporation was formed, it adopted the fees originally fixed by Dr. Henderson when operating the hospital as an individual. It appeared that all deficits of the hospital were paid for by him. It also appeared from the incorporation proceedings that the organization was so arranged that the power to control the property was in Dr. Henderson. The control was not given irrevocably as a charity to a charitable or benevolent institution. The benefit conferred by the organization of the hospital, the court held, could not be said to be so much to the public and so little to the donor and corporate owners as to place it in the class of property covered by the tax exemption statute. It is not unusual, said the court, for professional men to fail in collecting a just fee for some of their effort. A profession is based on an ideal which comprehends service to mankind. While the loser may find solace in the thought that by reason of a patient's failure to pay his bill a contribution to charity has been made, the kindness granted cannot become a justification for exemption from taxation on the hospital in which the service was rendered. Accordingly, as in the Prairie du Chien case, the Supreme Court held that the Riverview Hospital corporation was subject to local taxation.—*Prairie du Chien Sanitarium Co., Inc. v. City of Prairie du Chien, 7 N. W. (2d) 832 (Wis., 1943); Riverview Hospital v. City of Tomahawk, 11 N. W. (2d) 188 (Wis., 1943).*

Society Proceedings

COMING MEETINGS

Annual Congress on Industrial Health, Chicago, February 15-16. Dr. Carl M. Peterson, 535 N. Dearborn St., Chicago 10, Secretary.

Annual Congress on Medical Education and Licensure, Chicago, February 14-15. Dr. Victor Johnson, 535 N. Dearborn St., Chicago 10, Secretary.

American Academy of Orthopaedic Surgeons, Chicago, January 22-26. Dr. Myron O. Henry, 825 Nicollet Ave., Minneapolis, Secretary.

Annual Forum on Allergy, St. Louis, Jan. 22-23. Dr. Jonathan Forman, 394 East Town St., Columbus, Ohio.

Clinical Orthopaedic Society, Chicago, January 22-26. Dr. Myron O. Henry, 825 Nicollet Ave., Minneapolis, Secretary.

Society of Surgeons of New Jersey, Atlantic City, January 29. Dr. Walter B. Mount, 21 Plymouth St., Montclair, N. J., Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1934 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Journal of Psychiatry, New York

100:159-300 (Sept.) 1943

Spirogram in Certain Psychiatric Disorders. J. E. Finesinger.—p. 159.
Immaturity and Crime. R. S. Banay.—p. 170.
Bilateral Prefrontal Lobotomy: Survey. L. H. Ziegler.—p. 178.
Remarks on Problems of Psychosurgery. G. W. Kisker.—p. 180.
Insanity as Ground for Annulment or Divorce in English and American Law (1). W. E. McCurdy.—p. 185.
Rehabilitation of Epileptic Service Men. W. G. Lennox.—p. 202.
Dawn of Psychiatric Journalism. M. K. Amdur.—p. 205.
Psychoneuroses Incidental to Preflight and Primary Flight Pilot Training. W. O. Klingman.—p. 217.
Prognostic Possibilities of Rorshach Method in Metrazol Therapy. W. W. Morris.—p. 222.
Approach to Psychologic Control Studies of Urinary Sex Hormones: Report on Three Menstrual Cycles. G. E. Daniels.—p. 231.

American Journal of Surgery, New York

62:1-144 (Oct.) 1943

*Craniocerebral Wounds: Exteriorization Method of Treatment. J. Browder.—p. 3.
*Post-Traumatic Psychosis in the Aged: Treatment with Sex Hormones. H. D. Cogswell and S. C. Davis.—p. 9.
Pentothal Sodium in Major Surgical Procedures. J. D. Holly.—p. 13.
Symptoms Following Cholecystectomy: Some Brief Clinical Notes. D. MacDonald.—p. 19.
Peripheral Arterial Embolism: Brachial Embolism Successfully Treated. R. D. Duncan and M. E. Myers.—p. 34.
Acute Gastroduodenal Perforations: Review of Metropolitan Hospital Series 1930-1941. E. J. McCabe and W. L. Mersheimer.—p. 39.
Perforating Wounds of Intestine: Satisfactory Method of Treatment for Wounds More Than Twenty-Four Hours Old. T. B. Noble Jr.—p. 50.
Diagnosis and Treatment of Obstruction of Small Intestine. L. C. Bennett.—p. 59.
Myometrial Mobilization. F. A. Kassebohm and M. J. Schreiber.—p. 65.
Major Resection for Functional Gastrointestinal Disease: Report and Evaluation of 2 Cases. A. Strelinger.—p. 72.
Theory and Therapy of Shock: Varied Fluid Injections. F. M. Allen.—p. 80.
Recurrent Incarceration of Left Interstitial Inguinal Hernia. L. A. Thunig.—p. 105.
Control of Postoperative Pain: Application of Cold to Operative Site. E. G. Krieg.—p. 114.
Use of Water Soluble Chlorophyll in Oral Sepsis: Experimental Study of 300 Cases. S. L. Goldberg.—p. 117.
Plastic Material in Medicine: Preliminary Report on Use of Lucite and Nylon Fabric in Orthopedic Surgery. M. S. Burman.—p. 124.

Craniocerebral Wounds: Exteriorization Method of Treatment.—Browder has been applying for several years a method for neglected wounds of the brain which is patterned after the plan of exteriorization of brain abscess as recommended by King. This method prevents the formation of fungus cerebri. The scalp, bone, dura and brain are debrided and all softened cerebral tissue is removed by suction, hemostasis being secured by applying the electrocoagulating current to the metal tube of the sucker whenever a blood vessel is drawn into it. The dura should be cut away to the limits of the cerebral defect. After débridement, cerebrospinal fluid should be withdrawn through the spinal needle in order to reduce the possibility of cerebral herniation. After the cerebral cavity has been opened widely, the entire area is covered with a single layer handkerchief of mesh gauze (44 by 40 per square inch). Sulfanilamide crystals are blown on to the handkerchief lining the cavity. The cavity is then packed with ½ inch gauze strips to the level of the scalp. The flaps of scalp are brought over the area and loosely approximated. A snug fitting dressing composed of wet, flat gauze held firmly in place by a skull cap should be applied to prevent herniation. The wound is not dressed for three to five days. For dressing the patient is placed on his side, cerebrospinal fluid is withdrawn from the lumbar thecal sac, the wound is reopened and the gauze pack is removed. The cavity lined with the adherent gauze handkerchief is filled with full strength hydrogen peroxide and washed out with saline solution. This should be repeated three or four times before an attempt is made to loosen the handkerchief. The removal of the lining gauze at the first dressing is a slow and tedious procedure, but each dressing becomes less arduous. In about ten to twelve days the entire cavity is covered with granulation tissue, the surface of which must not be injured during dressings. Slowly the cerebral wound becomes smaller and finally, by gradual decrease in the amount of intracranial packing, the granulating surface rises to the level of the cranial vault. After epithelization becomes complete, plastic repair of the scalp and cranial defect may be carried out at a later date.

Sex Hormones in Post-Traumatic Psychosis in the Aged.—Cogswell and Davis point out that not infrequently a senile person placed in bed to recover after some form of trauma, often trivial, breaks down mentally or physically and dies. Many of these patients appear to be in excellent condition up to the time of their injury. Getting these people out of bed as soon as possible and allowing them to exercise is of value in preventing this syndrome. In many cases this cannot be allowed, owing to the nature of the patient's injury. The authors report that 3 patients showed mental symptoms following injuries confining them to bed. Because such mental symptoms were not seen in younger patients under similar conditions, gonadotropic substance was given, and the mental symptoms have disappeared.

American Journal of Tropical Medicine, Baltimore

23:475-568 (Sept.) 1943

Laboratory Report on Clinical Syndrome Referred to as "Bullis Fever." H. R. Livesay and M. Pollard.—p. 475.
Complement Fixation Test in Diagnosis of Yellow Fever: Use of Infectious Mouse Brain as Antigen. E. H. Lennette and Alina Perlowagora.—p. 481.
Distribution of Yellow Fever in Colombia in Recent Years. H. H. Smith, G. Bevier and J. C. Bugher.—p. 505.
Biochemical Reactions, Cultural Characteristics and Growth Requirements of Trypanosoma Cruzi. H. A. Senekjie.—p. 523.
Heavy Density of Plasmodium Falciparum Parasites in Malaria: Report of Case. A. N. Springall.—p. 533.
Toxic Action of Latrodectus Mactans Bite and Its Treatment: Clinical and Experimental Studies. R. R. L. Sampayo.—p. 537.
Ectopic and Hepatic Human Fascioliasis. A. Neghme and M. Ossandon.—p. 545.
Relative Importance of Certain Factors in Low Temperature Preservation of Malaria Parasites. R. E. Manwell and Ruth Edgett.—p. 551.

American Review of Soviet Medicine, New York

1:1-94 (Oct.) 1943

Organization of Medical Care for Wounded. E. I. Smirnov.—p. 9.
Effect of Frostbite on Sympathetic Nervous System. N. N. Burdenko.—p. 15.
Time Element in Restorative Surgery of Peripheral Nerve Lesions. V. V. Lebedenko.—p. 23.
*Nerve Transplantation. N. I. Propper-Grashchenkov.—p. 28.
Spasokukotski's Method of Feeding Abdominal Wounds. P. A. Panikov.—p. 32.

Nerve Transplantation.—Propper-Grashchenkov discusses experiments on replacing defects in peripheral nerves, in particular the Ignatov method of utilizing human nerves taken from corpses and treated with solution of formaldehyde. Ignatov used corresponding nerves, so that the diameter of the nerves could be matched. During the Finnish war there were 13 cases of transplantation in which the defects were so large that direct contact of the severed nerves was impossible. One sciatic nerve defect amounted to 12 cm. There were cases of defects of the median, radial and ulnar nerves. Repeated chronaxia examinations were made; motor and sensory functions of the involved extremities were tested with electrometric instruments. Observations demonstrated that the implanted nerve acted as a dead tissue bridge, thereby assuring the regeneration of the nerve fibers. Usually, when motor and sensory functions are lost, a disturbance takes place in the circulation and perspiration of the extremity. It becomes cyanotic, clammy and often covered with ulcers. Every case of transplantation of the formaldehyde

treated nerve tissue showed an improvement in each of these dystrophic processes. The transplantation of human nerves in large peripheral nerve defects accelerates the regeneration and reestablishment of the lost motor, sensory and trophic functions and prevents the wounded from becoming invalids.

Archives of Internal Medicine, Chicago

72:429-564 (Oct.) 1943

*Immune Serum Therapy for Oroya Fever. C. Howe.—p. 429.
Relation Between Hepatic and Plasma Concentrations of Vitamin A in Human Beings. H. Popper, F. Steigmann, K. A. Meyer and S. S. Zevin.—p. 439.
Changes in Optic Function and Ophthalmoscopic Picture: Observed in Four Patients of Eunuchoid Skeletal Type Who Were Being Treated with Orchic Extract. M. Kutscher.—p. 461.
*Acquired Hemolytic Anemia. V. R. Mason.—p. 471.
Therapeutic Observations in Cushing's Syndrome: Effect of Various Agents on Calcium, Phosphorus and Nitrogen Excretion in Patient with Pituitary Basophilism. W. H. Perloff, E. Rose and F. W. Sunderman.—p. 494.
*Cold Hemagglutination with Symmetrical Gangrene of Tips of Extremities: Report of Case. D. Stats and J. G. M. Bullowa.—p. 506.
Vascular Diseases: Ninth Annual Review. T. R. Van Dellen, G. de Takáts and G. W. Scupham.—p. 518.

Immune Serum Therapy for Oroya Fever.—According to Howe there have been numerous attempts at immune therapy with serum or transfusions of whole blood from patients convalescing or recovered from various stages of Carrión's disease. The few available reports are inconclusive and neither substantiate nor detract from the possibility that such forms of passive immunization may be beneficial in certain cases. Arsenical preparations have been tried with unconvincing effects. The present communication deals with 3 cases of Oroya fever in which hyperimmune rabbit serum containing a high titer of agglutinins for Bartonella bacilliformis was given in moderately large intravenous doses. Immune serum was produced in rabbits by the intravenous administration of large amounts of Bartonella bacilliformis both in the fresh and in the formaldehyde treated state. There was no dramatic change in the clinical picture in any of the 3 cases as a result of immune serum therapy except for the prompt appearance of the typical eruption in 1 case. In this case the time of eruption was earlier than is usual in untreated Oroya fever. It is thought that intravenous administration of immune rabbit serum may have caused an appreciable diminution in the percentage of erythrocytes infected with Bartonella bacilliformis. A comparison is made of these cases with 5 cases of severe untreated Oroya fever from Colombia. The reduction of visible erythrocyte infection appears to be much more gradual in these cases than in those in which immune serum was used in treatment.

Acquired Hemolytic Anemia.—Mason shows that the anemia produced by accelerated disintegration of red blood cells leading to jaundice, increased excretion of urobilinogen and moderate splenomegaly is often accompanied by morphologic alterations of the red cells and is usually classified as hemolytic anemia. He observed a number of patients with hemolytic icterus of unknown cause and with acute or a subacute course similar to cases reported by Widal and by Chauffard. He has records of patients with chronic acquired hemolytic anemia of unknown cause whose disease began acutely and followed a course characterized by a continuous increased hemolysis and by recurrent severe crises of hemolysis similar to those seen in acute acquired hemolytic anemia. The 12 cases reported here were observed subsequent to 1916. The disease is relatively rare. The cases of acute or chronic hemolytic anemia of the acquired type are characterized by more or less rapid destruction of erythrocytes. Splenomegaly is constant. It is probable that the destruction of blood occurs chiefly in the spleen. There is a pseudomacrocytic blood picture, usually with a high color index. Large numbers of macrocytes and microspherocytes are present in the blood film during the hemolytic crises in the acute type of the disease or constantly in the chronic type of the disease. The red cells may show extreme osmotic fragility or they may be normally resistant to hypotonic saline solutions. This abnormality is not related to the number of spherocytes in the circulating blood. The blood may or may not contain autoagglutinins or autohemolysins. The disease is neither hereditary nor congenital, and no etiologic factor has been determined in any of the reported cases. The acute type of the disease has been reported as Lederer's anemia. Subacute and chronic types are probably more frequent than is commonly believed. The disease may heal spontaneously, or it may be cured by transfusions or by splenectomy. The more chronic types of the disease may or may not be cured by the removal of the spleen. During the serious hemolytic crisis removal of the spleen may be life saving even if it does not lead to complete cure.

Cold Hemagglutination with Symmetrical Gangrene of Tips of Extremities.—Stats and Bullowa point out that the antigen-antibody reaction between human erythrocytes and serum in which hemagglutination is observed only at low temperatures (below 68 F.) occurs in diverse pathologic states, such as Raynaud's syndrome, acute and chronic acquired hemolytic anemias, trypanosomiasis, acute bacterial infections, cirrhosis of the liver, leukemia, pernicious anemia, lymphoblastomas and bland venous thrombosis. Its presence in low titer has been recorded in at least 95 per cent of normal persons. There is only one previous report of the occurrence of gangrene of the extremities due to the action of a cold hemagglutinin. In the case reported by the authors an American Negro aged 64 noticed, fifteen years before admission, tingling, burning and numbness of the tips of his fingers and toes on exposure to a low environmental temperature. Two weeks prior to admission the patient was exposed to a temperature of approximately 5 F. for about sixty minutes while waiting for a bus. During this time he was clad warmly. He spent most of the hour standing still. He observed the same tingling of his fingers and toes that he had experienced many times before, and the first urine passed was dark. On his admission to the hospital the tips of the fingers to the distal interphalangeal joints were tense, tender, painful and cool to touch. In the lower extremities all the arterial pulses were easily felt. Both feet were moderately edematous and tender. The patient could not move his toes, and they were insensitive to pain stimuli. The toes were exquisitely tender and cool to touch. Laboratory studies revealed (*a*) unilateral hemoglobinemia following exposure of a forearm to cold, (*b*) hemagglutination in the capillaries of the conjunctiva due to cold and (*c*) absence of syphilis or evidence of a hemolytic anemia. No cause could be found to explain the presence of the cold hemagglutinin. A discussion is presented of clinical conditions in which transient or permanent arterial insufficiency of the extremities occurs despite adequate pulsation and absence of disease of the peripheral arteries. All the cases of cold hemagglutination reported in the literature in association with arterial insufficiency of the extremities or hemoglobinuria are tabulated.

California and Western Medicine, San Francisco

59:155-204 (Sept.) 1943

Virus Pneumonia: Etiologic Studies. M. D. Eaton.—p. 160.
Preemployment Examinations: Unusual Findings at Douglas Aircraft Corporation. W. S. Keate.—p. 162.
Chemotherapy: Its Role in Traumatic Surgery. T. E. Reynolds.—p. 164.
Large Vesical Calculus in Association with Gigantism. E. F. Nation.—p. 167.

59:205-252 (Oct.) 1943

Lymphocytic Hyperplasia and "Spontaneous" Alimentary Lesions. A. W. Meyer.—p. 210.
New Transverse Low Abdominal Incision. L. S. Cherney.—p. 215.
Tropical Diseases. R. F. McLaughlin.—p. 218.
Virus Pneumonia: Review of Pathology. J. B. McNaught.—p. 220.
*Fecal Impaction: Report of Unusual Case. A. M. May and E. Torre.—p. 224.

Fecal Impaction.—May and Torre report an unusual case of fecal retention. A woman aged 52 had shown progressive enlargement of the abdomen over a period of two years. She was emaciated, but her abdomen was enlarged to the size of a full term pregnancy. She claimed to have had no bowel movement for a year and a half. Her statement could not be believed, and a large ovarian cyst was thought of. Operation revealed that the descending colon from the splenic flexure to the sigmoid had become enormously dilated with feces, the bowel wall thinned to a cystlike appearance. An incision was made into the distended bowel and approximately 5 gallons of inspissated fecal material was removed. Search was made for an obstructive growth but none could be found. A temporary loop colos-

tomy above the distended bowel was established. The patient's recovery was uneventful. Because of the recovery and the ultimate restoration of normal bowel activity, the authors feel that this case was a true fecal impaction rather than a megacolon of the Hirschsprung type.

Indiana State Medical Assn. Journal, Indianapolis

36:535-576 (Oct.) 1943

Vaginal Hysterectomy: Indications and a Method. J. M. Waugh.—p. 537.
Control of Tuberculosis in Industry. A. G. Kammer.—p. 541.
Control of Scarlet Fever in Indiana (Isolation and Quarantine). J. W. Jackson.—p. 544.

36:577-632 (Nov.) 1943

Modern Treatment of Prostatic Cancer—Rational Basis for Delayed Hormone Therapy. R. M. Nesbit and R. H. Cummings.—p. 577.
Anatomical Dissection of Paul deKruif's Book "Kaiser Wakes the Doctors." F. T. Romberger.—p. 579.
Mass Typhoid Fever Immunization—Intradermal Method. M. Kamp.—p. 584.
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Intestinal Parasitism in Selected Groups of Rural Residents of Indiana. W. H. Headlee and W. B. Hopp.—p. 592.
Fatal Aspiration of Foreign Body (Vomiting and Aspiration of Stomach Contents: Downing). H. A. Kuhn.—p. 595.

Iowa State Medical Society Journal, Des Moines

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Tropical Diseases in Iowa in Postwar Era. J. A. Greene.—p. 455.
Treatment of Industrial Wounds. H. W. Meyerding.—p. 460.
Surgery in Medical Emergencies. A. C. Pfohl.—p. 464.
Epidemic of Typhoid Fever in Iowa: Food Borne Outbreak Caused by Small Colony Strain of Eberthella Typhosa. F. J. Condon and I. H. Borts.—p. 467.

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Surgical and Clinical Contribution to Right Sided Pain. B. R. Weston.—p. 505.
Early Diagnosis and Treatment of Tuberculosis. P. O. Nelson.—p. 509.
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Journal of Aviation Medicine, St. Paul

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Partial Pressures of Carbon Dioxide and Oxygen in Expired Air and Alveolar Air When Oxygen Is Breathed at Different Atmospheric Pressures. T. M. Carpenter and R. C. Lee.—p. 240.
*Value of Carbon Dioxide in Counteracting Effects of Low Oxygen. F. A. Gibbs, E. L. Gibbs, W. G. Lennox and L. F. Nims.—p. 250.
Effect of Fasting on Resistance to Anoxia. C. P. Leblond, J. Gross and H. Laugier.—p. 262.
Physiologically Induced Myocardial Ischemia as Test of Circulatory Efficiency as Applied to Selection of Pilots. W. M. Barlett.—p. 264.
Effect of Simulated Altitudes on Spinal Fluid and Venous Pressure of Dogs. A. M. Sutherland, N. J. Molumut and R. D. Brookes.—p. 280.
Medullary Hormone Content of Adrenals of White Rats Subjected to Low Atmospheric Pressure. W. Raab.—p. 284.
Importance of Vision in Aviation. E. M. F. Weaver.—p. 289.
Factors in Care of Flier. H. M. Turk.—p. 300.

Carbon Dioxide for Counteracting Effects of Low Oxygen.—A study of arterial and internal jugular blood and of brain function in 8 healthy young men who breathed mixtures containing low percentages of oxygen and varying rations of nitrogen and carbon dioxide revealed, according to Gibbs and his associates, that normal brain function can be maintained in spite of a low percentage of oxygen in the inspired air (as low as 2 per cent), provided the carbon dioxide tension of the body is maintained. The addition of carbon dioxide to low oxygen mixtures permits maximal utilization of the available oxygen because of (*a*) increased pulmonary ventilation and consequent increased oxygenation of the arterial blood, (*b*) peripheral vasoconstriction and cerebral vasodilatation, insuring to the brain a maximal share of the circulating blood, and (*c*) shift in the hemoglobin dissociation curve so that the blood unloads a greater proportion of its oxygen in the tissue. The improvement in the oxygen supply to the brain is only one aspect of the matter. The maintenance of the carbon dioxide tension of the brain is of equal importance for normal brain function. Gross cortical dysfunction manifested by high voltage slow activity in the electroencephalogram and by mental confusion occurs when the carbon dioxide tension of the brain falls as a result of breathing low oxygen mixtures, even though the oxygen tension of the brain may be sufficient to maintain normal brain function. If the oxygen tension of the brain is lowered while the carbon dioxide tension of the brain is maintained, consciousness is lost without a preceding period of confusion and without the occurrence of high voltage slow waves in the electroencephalogram.

Journal of Bone and Joint Surgery, Boston

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Treatment and Results in Localized Osteitis Fibrosa Cystica (Solitary Bone Cyst). A. D. McLachlin.—p. 777.
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Complement Fixation Test with Human Serums Against Viruses of St. Louis Encephalitis and Equine Encephalomyelitis. Beatrice F. Howitt.—p. 293.
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Dermal Supersensitivity, Heat Labile and Heat Stable Antibody Against Ragweed in Cattle. A. J. Weil and L. Reddin Jr.—p. 345.

Journal of Lab. and Clinical Medicine, St. Louis

28:1535-1654 (Oct.) 1943

Physics of Sound, with Particular Relation to Examination of Patient. E. M. Chapman and A. Goldstein.—p. 1535.
Effect of Tungsten Metal Diets in Rat. F. W. Kinard and J. van de Erve.—p. 1541.
Sulfathiazole and Staphylococcus Antitoxin in Experimental Staphylococcic Infection. E. Steinfield, M. Brylawski and Carrie B. Nash.—p. 1544.
Carotid Sinus Syndrome: Report of Three Additional Cases from Cardiologic Service, U. S. V. A. Facility, Columbia, South Carolina. S. L. Zimmerman.—p. 1548.
Influence of Muscular Work and Fatigue on State of Central Nervous System. E. Simonson, N. Enzer and R. W. Benton.—p. 1555.
Significance of Erythrocytic Pseudoagglutination. R. D. Barnard.—p. 1568.
Occurrence of Double Zone Phenomenon in Antihuman Tissue Serum. A. Nettleship.—p. 1572.
Hematology of Peripheral Blood and Bone Marrow of Dog. E. J. Van Loon and B. B. Clark, with technical assistance of Dorothy Blair.—p. 1575.
Effects of Sulfapyrazine and Sulfadiazine on Mice Infected with Hemolytic Streptococcus, Pneumococcus and Staphylococcus Aureus. G. W. Raiziss, Marie Severac and J. C. Moetsch.—p. 1580.
New Method for Evaluation of Drugs Affecting Reaction of Mice to Pain Stimulation. K. Kueter and R. K. Richards.—p. 1585.
Chronic Indurative Pneumonia Resulting from Cardiospasm: Case with Nonpathogenic Acid Fast Bacilli in Sputum. F. C. Warring Jr. and A. B. Rilance.—p. 1591.
Studies in Prothrombin: V. Arterial and Venous Plasma Prothrombin Time in Man. S. Shapiro.—p. 1596.

Journal of Nutrition, Philadelphia

26:327-442 (Oct.) 1943

Field Peas as Source of Protein for Growth. Ella Woods, W. M. Beeson and D. W. Bolin.—p. 327.
Ratio of Ascorbic Acid, Riboflavin and Thiamine in Raw and Pasteurized Milk. A. D. Holmes, C. P. Jones, Anne W. Wertz and J. W. Kuzmeski.—p. 337.
Some Results of Feeding Rats a Human Diet Low in Thiamine and Riboflavin. G. M. Higgins, R. D. Williams, H. L. Mason and A. J. Gatz.—p. 347.
Role of Biotin and "Folic Acid" in Nutrition of Rhesus Monkey. H. A. Waisman and C. A. Elvehjem.—p. 361.
Losses of Vitamins in Large Scale Cookery. Christene A. Heller, C. M. McCay and C. B. Lyon.—p. 377.
*Adequacy of Industrial Lunch and Use of Brewers' Yeast as Supplement. Christene A. Heller, C. M. McCay and C. B. Lyon.—p. 385.
Factors Influencing Bioassay of Vitamin E. B. R. Homrich.—p. 391.
Performance of Normal Young Men on Controlled Thiamine Intakes. A. Keys, A. F. Henchel, O. Mickelsen and J. M. Brozek.—p. 399.
Studies of Average American Diet: II. Riboflavin, Nicotinic Acid and Pantothenic Acid Content. V. H. Cheldelin and R. R. Williams.—p. 417.
Mineral Composition of Albino Rat as Affected by Chloride Deficiency. E. J. Thacker.—p. 431.

Brewers' Yeast as Supplement to Industrial Lunch.—Heller and her collaborators sampled the noon meal served to workers in a cafeteria in the Brooklyn Navy Yard for the riboflavin, niacin and thiamine contents. It was found that this noon meal usually furnishes at most only one fourth of the day's requirements for these vitamins. Dry brewers' yeast has provided a satisfactory method of supplementing the supply of these vitamins. This yeast was usually incorporated in the meat dishes at conservative levels, so that the taste was not detected. Since yeast is rich in protein of good quality it also affords a good source of this dietary factor.

Journal of Urology, Baltimore

50:389-514 (Oct.) 1943

Adenoma of Kidney with Associated Lesions: Report of 3 Cases. H. G. Bugbee.—p. 389.
*Wilms Tumor of Kidney: Clinicopathologic Study of 44 Proved Cases. W. Weisel, M. B. Dockerty and J. T. Priestley.—p. 399.
Infected Solitary Cyst of Kidney in Child, with Review of Literature. T. S. Chalkley and L. E. Sutton Jr.—p. 414.
Ureteropelvic Obstruction Due to Extrinsic and Intrinsic Lesions of Ureter as Clinical Entity and Its Treatment. C. L. Deming.—p. 420.
Technic and After-Care of Cystopuncture Using New Cystome. E. E. Ferguson and H. A. Trangsrud.—p. 432.
Transurethral Surgery in Relation to Bilharziasis of Bladder. H. R. Newman.—p. 440.
Simple Automatic Bladder Irrigator. E. Rupel and C. G. Culbertson.—p. 446.
Use of Nonabsorbable Stay Sutures as Primary Means of Closure in Suprapubic Prostatectomy. W. F. Melick.—p. 449.
Appraisal of Collateral Findings in Cases of Prostatism. J. A. Lazarus.—p. 458.
Malignant Tumor of Interstitial Cells of Testis with Prostatic Carcinoma. J. G. Sharnoff and J. R. Lisa.—p. 471.
Pistol Grip for Stern-McCarthy or Nesbit Resectoscope. H. J. Walder and M. P. Ersfeld.—p. 474.
Tuberculoid Reaction in Seminoma. M. Cohen and J. J. Lee.—p. 477.
True Hermaphroditism: Case Report, with Interpretations. J. K. Lattimer, E. T. Engle and R. C. Yeaw.—p. 481.
Treatment of Burns of External Genitalia. A. C. Drummond.—p. 497.
Reciprocal Transfusions of Blood in Anuria: Report of Case. T. D. Slagle and J. A. Pons.—p. 503.
Ideal Penile Anesthesia: Obtained by Injection of Corpora Cavernosa. M. A. Magid and O. S. Culp.—p. 508.

Wilms Tumor of Kidney.—Weisel and his associates studied records of 101 patients who were seen at the Mayo Clinic from 1904 to 1940 inclusive and whose condition was diagnosed as Wilms tumor, embryonal sarcoma, mixed tumor of the kidney or sarcoma of kidney. A careful weeding out revealed 44 Wilms tumors. Wilms tumor (embryonal carcinosarcoma of the kidney) is a malignant mixed tumor of the kidney seen primarily in childhood, but it can occur at any age. The most prominent clinical feature is an abdominal mass. Fever, emaciation and hematuria are common. The clinical course is progressive and as a rule rapidly downhill. The treatment of choice is prompt surgical extirpation combined in certain cases with preoperative irradiation and always followed by postoperative roentgen treatment. The majority of patients fail to survive one year. In the present series only 7 of the 44 patients were living two to twenty years after operation. The pathologic diagnosis of Wilms tumor depends on the finding of glandular and stromal cells in a more or less characteristic mixed tumor arrangement. Other types of tissues, notably striated muscle, are found in about half of the cases. The origin of Wilms tumors is obscure.

Military Surgeon, Washington, D. C.

93:389-442 (Nov.) 1943

Treatment of Burns at Army Air Forces Advanced Flying School. L. R. Weinshel.—p. 389.
Different Concept of Reactions Following Sulfathiazole Readministration. R. C. Green, M. L. Steckel and J. M. Michener.—p. 399.
Use of Plastics in Reconstructive Surgery: Lucite in Arthroplasty; Tissue Tolerance for Lucite; Its Use as Interposition Mold in Arthroplasty of Hip and of Phalangeal Joints; Report of 3 Cases. M. Burman and R. H. Abrahamson.—p. 405.
Asthenopia and Amblyopia Caused by Congenital Lens-Vitreous Changes: Study of 25 Cases. A. B. Berkove.—p. 415.
Effect of Acute Hepatitis on Renal Function. G. C. Prather, E. E. Ferguson and L. M. Rosati.—p. 418.
Chronic Meningococcic Septicemia: Report of Case. J. S. Yoskalka.—p. 421.
Mechanical Aid for Administration of Pentothal Sodium Intravenous Anesthesia. F. F. Rudder.—p. 426.
Hookworm Infestation: Comparative Methods of Treatment. W. C. Wallace and D. T. Chamberlin.—p. 427.

Nebraska State Medical Journal, Lincoln

28:305-336 (Oct.) 1943

Incisional Hernia. F. W. Bancroft.—p. 308.
Diagnosis and Prevention of Rheumatic Recrudescences in Children. A. E. Hansen.—p. 314.
Recent Advances in War Surgery. J. E. M. Thomson.—p. 317.
Glaucoma—Short Résumé. W. H. Morrison.—p. 323.

28:337-368 (Nov.) 1943

Bronchoscopy as Diagnostic and Therapeutic Procedure. S. Iglauer.——p. 340.
Present Status of Liver Tests. L. T. Hall.—p. 345.
Further Observations on Lanatoside C. M. Margolin.—p. 348.
Rupture of Urethra Associated with Fracture of Pelvis. P. Adams.—p. 351.
Treatment of Gonorrheal Vulvovaginitis with Estrogens. W. E. Brown.—p. 354.
Undulant Fever in Nebraska and Its Diagnosis. L. O. Vose.—p. 359.

New York State Journal of Medicine, New York

43:1903-2014 (Oct. 15) 1943

Clinical Syndrome in Children Resembling Rheumatic Fever. A. D. Kaiser.—p. 1937.
Prevention of Rheumatic Recurrences: Discussion of Various Measures Now Being Used. Ann G. Kuttner.—p. 1941.
Potentialities in School for Rheumatic Fever Control. G. M. Wheatley.—p. 1947.
Effective Use of Thyroid in Periodic Paralysis. A. Wolf.—p. 1951.
Clinical Use of Adrenal Cortical Hormones: Preliminary Report. J. H. Lapin, S. F. Goldman and A. Goldman.—p. 1964.
*Incidence of Gross Renal Lesions in Cases of Hypertension. P. W. Aschner, B. S. Epstein and H. Mandelbaum.—p. 1970.
Anesthesia for Thoracic Surgery. B. Etsten.—p. 1980.
Three New Tools of Science. D. F. Winnek.—p. 1986.

Renal Lesions in Hypertension.—Aschner and his associates describe their urographic studies on 100 patients with hypertension and present illustrative case reports on renal lesions in hypertensive patients. They feel that in view of the newer knowledge of arterial hypertensive disease internists should insist on a urologic study of all such patients, excretion urography being the minimal requirement. Urologists should give more attention to the blood pressure trends in their patients in order to detect incipient hypertension and evaluate its relationship to the urologic disorder. Pathologists should study the main renal vessels in kidneys removed at operation and obtained post mortem. Discovery of obstructive uropathies in their early stages is the duty of every practitioner. The exhibition of the newer urinary antiseptics (mandelates, sulfonamides) may materially lessen the incidence of progressive pyelonephritis. The relationship of a unilateral renal lesion to coexistent hypertension is an individual problem. In occasional instances it is a definite etiologic factor, in some instances it is contributory, in most it is coincidental. The decision regarding nephrectomy in hypertensive patients should be based on the nature of the renal lesion alone, with due reference to consideration of conservation of renal tissue which may later stand the patient in

good stead. When the causal relationship of a unilateral renal lesion to hypertension seems probable, early recognition of this relationship, with prompt nephrectomy, enhances the likelihood of a good result.

Radiology, Syracuse, N. Y.

41:315-420 (Oct.) 1943

Some Aspects of Teaching of Radiologic Physics. Edith H. Quimby.—p. 315
Limitations of Physics in Radium Therapy. H. M. Parker.—p. 330.
Some Recent Applications of Nuclear Physics. J. M. Cork.—p. 337.
Differential Tissue Response to Neutron and Roentgen Radiations. I. Lampe and F. J. Hodges.—p. 344.
X-Rays in Curable Heart Disease. M. C. Sosman.—p. 351.
Diverticulum of Bladder: Method of Roentgen Examination and Roentgen and Clinical Findings in 200 Cases. W. Hartung and R. H. Flocks.—p. 363.
Review of Carcinoma of Bladder Treated by Supervoltage X-Rays over Five Year Period. F. H. Colby and M. D. Schulz.—p. 371.
Roentgenologic Diagnosis of Parasternal Omental Hernia. L. L. Robbins.—p. 378.
*Treatment of Radiation Sickness with Vitamin B$_6$ (Pyridoxine Hydrochloride). J. R. Maxfield Jr., A. J. McIlwain and J. E. Robertson.—p. 383.

Vitamin B$_6$ (Pyridoxine Hydrochloride) in Radiation Sickness.—Maxfield and his associates call attention to the great variation in the reaction to radiation therapy. Its severity is apparently dependent on some inherent susceptibility in the patient. A patient suffering from malnutrition, debilitation and avitaminosis will usually not tolerate radiation therapy as well as a patient in good nutritional balance. There are many patients in whom vitamin B$_1$ and vitamin B complex are not effective. The authors administered 25 mg. of pyridoxine hydrochloride intravenously to patients in whom a definite radiation sickness was present. In most instances only one injection was necessary to stop the unfavorable symptoms. The authors recommend that 25 mg. be given intravenously immediately after the onset of radiation sickness and repeated at intervals of twenty-four to seventy-two hours as needed. The results have been most gratifying in a series of over 50 cases. Vitamin B$_6$ should supplement and not replace other methods. The use of liver extract, a high vitamin intake and sedatives is to be encouraged.

Review of Gastroenterology, New York

10:233-278 (Sept.-Oct.) 1943

Role of Food Allergy in Hypertension: Experimental Study. A. S. Price.—p. 233.
Anatomic Basis for Study of Splanchnoptosis: Paths of Ascent to Erect Position from Birth to Fourth Year of Life and Their Relation to Splanchnoptosis and Body Form and Body Cavities. Agnes C. Vietor.—p. 245.
Fate of Operated Gallbladder Patient, with Diagnostic, Roentgenological and Clinical Notes and Follow-Up Studies. L. Frank and C. E. Staats.—p. 254.
Influence and Danger of Latent Hepatic Disease in Operation on Gallbladder and Biliary Tract. A. O. Wilensky.—p. 268.

Rocky Mountain Medical Journal, Denver

40:569-640 (Sept.) 1943

Management of War Injuries of Chest. R. H. Meade Jr.—p. 586.
Social Hygiene in War. W. Clark.—p. 591.
Report of Meeting of Medical Service Plans Council of America, Chicago, Illinois, June 6, 1943. W. W. King.—p. 596.

40:641-712 (Oct.) 1943

Wagner-Murray-Dingell Bill. G. P. Lingenfelter.—p. 658.
Importance of Proctoscopy in Diagnosis and Treatment of Lower Bowel. H. R. Reichman.—p. 660.
Methods of Mortality Reduction in Amputations for Arteriosclerotic Gangrene. L. H. Segerberg.—p. 663.
Ureterocele. F. Mayner.—p. 665.

Texas State Journal of Medicine, Fort Worth

39:323-364 (Oct.) 1943

Meningitis Caused by Bacillus Haemophilus Influenzae: One Hundred Per Cent Recovery in Series of Four Cases. R. L. Nelson.—p. 327.
Eczematous Dermatitis Following Use of Sulfonamide Drugs on Skin. J. B. Howell.—p. 331.
Liposarcoma: Report of Case. J. Daly.—p. 332.
Primary Malignancies of Vaginal Wall: Two Case Reports. J. Furman.—p. 335.
Abdominal Pain During Pregnancy. H. L. Gardner.—p. 336.
Fallopian Tube Visualization. J. H. Robberson.—p. 340.
Management of Chalazia. M. Thomas.—p. 347.
Oil Nose Drops. M. P. Spearman.—p. 350.
Subnormal Child: Education for Social Living. J. T. Dailey.—p. 352.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Heart Journal, London

5:121-182 (July) 1943

Bacterial Aneurysm. E. N. Chamberlain.—p. 121.
Heart Changes in Alkalosis. J. S. Lawrence and E. N. Allott.—p. 128.
*Effects of Plasmochin, Atabrine and Quinine on Electrocardiogram. H. L. Heimann and B. G. Shapiro.—p. 131.
Subendocardial Infarction: Case. R. K. Price and L. R. Janes.—p. 134.
Extreme Cardiac Hypertrophy: Report of 2 Cases with Aortic Hypoplasia and Endocrine Disorders. W. T. Cooke and P. C. P. Cloake.—p. 139.
Eisenmenger's Complex. A. J. Glazebrook.—p. 147.
Casual and Basal Blood Pressures: I. In British and Egyptian Men. G. M. Alam and F. H. Smirk.—p. 152.
Id.: II. In Essential Hypertension. G. M. Alam and F. H. Smirk.—p. 156.
Id.: III. In Renal Hypertension. M. Gatman, M. Amin and F. H. Smirk.—p. 161.
Latent Heart Block. M. Campbell.—p. 163.

Effects of Plasmochin, Atabrine and Quinine on Electrocardiogram.—Heimann and Shapiro observed that leads 4 R and 4 F showed changes of the coronary type in a soldier aged 22 who complained of precordial pain while receiving plasmochin. Observations on convalescent malaria patients showed that plasmochin increased the amplitude of the various deflections, affecting the T wave most constantly. In some cases the most striking feature was the effect on the S-T segment which simulates the cardiogram of coronary thrombosis. Atabrine decreased the amplitude of the various deflections, also affecting the T wave most noticeably and constantly. It restored the S-T segment to the isoelectric level after it had been elevated by plasmochin. Quinine had an effect similar to atabrine but to a lesser degree. Differentiation between the effects of plasmochin on the one hand, and of atabrine and quinine on the other, in a particular patient may be made on the electrocardiographic findings. Plasmochin increased the size of the T wave above normal while quinine and atabrine decreased it below normal. Plasmochin often has an effect on the S-T segment, as described; this is not seen in the exhibition of either of the other two drugs.

British Journal of Ophthalmology, London

27:431-476 (Oct.) 1943

Significance of Distribution Ratios of Nonelectrolytes Between Plasma and Intraocular Fluid. S. Duke-Elder and H. Davson.—p. 431.
Detection and Significance of Melanophore Expanding Substance in Urine and Blood with Special Reference to Retinitis Pigmentosa. J. R. Mutch and D. MacKay.—p. 434.
War Injuries of Eye: Traumatic Proliferative Choroiditis Due to Double Penetrating Foreign Body. I. C. Michaelson and J. Kraus.—p. 449.
Subhyaloid Hemorrhage Following T. A. B. Inoculation. J. P. F. Lloyd.—p. 461.
Discission of Traumatic Hyaloid Diaphragm, March, 1941. J. Foster.—p. 462.
*Herpes Zoster Ophthalmicus—Two Rare Manifestations. T. G. W. Parry and G. C. Laszlo.—p. 465.
Rehabilitation of Uniocular Patient. C. G. Schurr.—p. 467.
Iridocyclitis and Choroiditis Due to "Silent" Sinusitis. Rosa Ford.—p. 469.

Herpes Zoster Ophthalmicus.—Parry and Laszlo direct attention to the occurrence of various ophthalmic conditions caused by herpes zoster. A woman aged 52 had an attack of herpes zoster along the ophthalmic branch of the right fifth nerve six weeks previously. The cornea was not involved, but there was a skin eruption with severe pain. Three and a half weeks after the eruption she suddenly lost sight in her right eye. The disorder was diagnosed as acute retrobulbar neuritis. After five weeks the visual acuity of the patient had improved. A man aged 33 had had "shingles" on his chest. Three weeks later he felt giddy and had double vision. Examination revealed paresis of the right abducent nerve. The condition gradually cleared up. The few existing statistics on the late ophthalmic involvements in herpes zoster reveal that they occur in the

following order of frequency: iridocyclitis (usually a complication with keratitis), optic neuritis and paralysis of the third, fourth and sixth cranial nerves. Retrobulbar neuritis has not been previously mentioned as a signal of herpes zoster.

Edinburgh Medical Journal

50:513-576 (Sept.) 1943

Diverticulum of Urinary Bladder: Series of 22 Cases. A. J. C. Hamilton.—p. 513.
Infection in Newborn. J. L. Henderson.—p. 535.
*Observations on 80 Consecutive Cases of Internal Pneumonolysis. R. S. Barclay.—p. 554.
James Barry—1792 (?)—1865 Inspector General of Army Hospitals. M. P. Russell.—p. 558.

Internal Pneumonolysis.—Barclay reports 103 thoracoscopies which were performed on 80 patients. There were two types of cases. One group included 57 patients in whom the cavity was held out by adhesions. Another group included 23 patients in whom adhesions prevented a concentric collapse of the lung which still contained active disease. In the first group the adhesions had to be divided because the pneumothorax was ineffective; in the second group continued traction exerted by the adhesions resulted in premature reexpansion of the lung. The method used was double puncture under local anesthesia. The author used the cautery alone and never encountered troublesome bleeding. In 50 of the patients complete division was effected and the disease was controlled; in 8 patients division was incomplete but the disease was nevertheless controlled; in 12 patients the disease remained uncontrolled because of incomplete division; in the remaining 10 patients it was not possible to cut the adhesions because of fusion of the lung with the chest wall. There were no deaths, and the patients were little upset by the intervention. Apart from 1 patient who developed a purulent effusion, the only complication encountered was a serous effusion, which occurred in 10 per cent of the patients. Section of adhesions converted over 70 per cent of unsatisfactory type of pneumothorax into a satisfactory type.

Lancet, London

2:433-464 (Oct. 9) 1943

Arthritis in Poliomyelitis. F. J. Poynton.—p. 433.
Streptococcic Meningitis Treated with Penicillin: Measurement of Bacteriostatic Power of Blood and Cerebrospinal Fluid. A. Fleming.—p. 434.
Mechanics of Head Injuries. A. H. S. Holbourn.—p. 438.
Effects of Drinking Small Quantities of Sea Water: Experimental Study. W. S. S. Ladell.—p. 441.
*Pneumonitis Associated with Autohemagglutination. S. Shone and R. Passmore.—p. 445.
Urinary Tract Infections in Royal Navy. J. Shafar.—p. 446.

Pneumonitis Associated with Autohemagglutination.—Shone and Passmore report observations on 54 consecutive cases of pneumonitis which occurred among Indian troops shortly after their arrival in the Middle East. The cases are divided into four groups: (1) atypical pneumonia, (2) short fever with cough and persistent lung signs, (3) afebrile laryngitis with little or no lung involvement and (4) proved malaria or splenomegaly with laryngeal or lung involvement. While investigating 1 of these cases of fever the authors observed that when a drop of blood was placed on a slide the red corpuscles immediately separated into clumps. An investigation in the medical wards led to the recognition of the described group of cases in which the predominant clinical features were fever and cough, the latter often associated with vomiting, hoarseness of voice and the presence of fine crepitations in the lungs: all showed the phenomenon of agglutination of red corpuscles. The men had been in camp near Delhi, where the incidence of fresh malarial attacks was high and some of them were still suffering from the effects of this disease. The authors sought for autohemagglutination in 331 Indian troops other than those with pneumonitis. The incidence was particularly high in patients with malaria. Many rickettsial infections involve the lungs, setting up a pneumonitis or interstitial pneumonia, and it is therefore relevant that all the patients examined were heavily infested with lice. The association of chronic malaria with so many of the cases must suggest the possibility of a malarial basis for the disease, but an outbreak of malarial pneumonitis is outside all previous experience.

Medical Journal of Australia, Sydney

2:221-240 (Sept. 18) 1943

With the Australian Army Medical Corps in Two Sieges: Anzac and Tobruk. C. Morlet.—p. 221.
Pathogenicity of Washed Clostridium Welchi and Mode of Development of Clostridium Welchi Infections in Man. Hildred M. Butler.—p. 224.
*Concentration and Drying of Serum for Intravenous Use. Marjorie Bick.—p. 227.

Concentration and Drying of Serum for Intravenous Use.—Bick describes a method of drying serum by precipitation of the serum proteins with alcohol and ether after preliminary concentration in cellophane casings. This process, which is known as hardyization, gives a finely divided product which can be dissolved readily, giving a perfectly clear reconstituted serum. The method so far has been used for drying 600 cubic centimeter lots of serum. No difference was observed between the serum protein concentration, the serum titer or group specific reducing power of the wet serum and that of dried serum reconstituted to its original volume. The advantages of this method of drying serum are the appearance of the product, the ease with which the dried serum can be reconstituted and the clearness of the reconstituted fluid. This clearness is due partly to the absence of fat and other lipoid material but also to the absence of denaturation of the protein. If the solvent is not properly cooled and the serum is not added slowly, a product which is hard to dissolve and gives a turbid reconstituted fluid may be obtained. The disadvantages of this method are the cost of the large volumes of ether used and the difficulty of transferring aseptically the dried product from the funnel to the bottle in which it is stored and reconstituted before administration. Since January 1941 90 pints of serum has been dried by this method, of which 80 has been reconstituted and given to patients. No unfavorable reactions were recorded. The reconstituted serum was invariably found to be sterile. Economy of solvent is effected by the preliminary concentration of the serum to one third of its original volume in cellophane casings. There appears to be no great difficulty in recovering the ether if the process is carried out on a large scale.

Helvetica Medica Acta, Basel

10:263-544 (June) 1943. **Partial Index**

Precardiac Thoracectomy and Hepatopexy in Ascites Caused by Adhesive Pericarditis. H. Curchod.—p. 269.
Surgical Treatment of Bleeding Gastric Ulcer. G. Neff.—p. 281.
*Clinical Aspects and Therapy of Mobile Duodenum. C. F. Geigy.—p. 303.
Cholecystenterostomy. A. Lehner.—p. 309.
Pneumatosis Cystoides Intestinalis. E. Ruppanner.—p. 313.
Implantation of Ureter According to Coffey in Ectopy of Bladder. E. Hagenbach.—p. 321.
Diagnosis and Surgical Therapy of Internal Vesical Fistulas. R. Allemann.—p. 329.
Surgical Treatment of Trigeminal Neuralgia. J. Rossier.—p. 331.
Treatment of Phlebitis by Infiltration of Lumbar Sympathetic with Procaine Hydrochloride. R. Koenig.—p. 337.
Securing Position of Surgically Treated Hallux Valgus and Other Foot Deformities by Means of Wiring Toe and Metatarsus. C. Henschen.—p. 351.
*Treatment of Habitual Shoulder Dislocation by Means of Metal Barrier Secured on Neck of Scapula and Coracoid Process. R. Ramser.—p. 377.

Mobile Duodenum.—Geigy observed in 1940 and 1941 5 patients with mobile duodenum who required surgical treatment because of severe and recurrent complaints. Mobile duodenum must be differentiated from ptosis of the duodenum which is caused by looseness of the retroperitoneal tissue. It is the result of a congenital malformation. It may be caused by failure (1) of the anterior loop to rotate around the vertical axis, (2) of the pyloric antrum and of the pars superior duodeni to rotate clockwise around its sagittal axis or (3) of the umbilical loop to rotate counterclockwise around the sagittal axis. The result is absence of duodenojejunal flexure. The

condition may also be caused by a lack of fixation of the duodenum to the posterior abdominal wall. Total mobile duodenum is comparatively rare. The majority of cases of mobile duodenum involve the superior part. As long as duodenal passage and bile discharge are not impaired, mobile duodenum is merely an anatomic defect which may be accidentally discovered by the roentgenologist. If symptoms develop, a mild dyspepsia, cholecystitis or duodenal ulcer may be simulated. The patients complain of a feeling of pressure in the epigastric region. The disturbance is not dependent on foods, so that dietetic treatment is ineffective. Nausea is frequent but vomiting is rare. If the duodenum is mobile beyond the duodenal papilla, biliary symptoms may predominate. There may be pain along the right costal arch with radiation toward the back and shoulder. The patients are usually of the asthenic type. General or partial ptosis may exist simultaneously. The clinical aspects generally do not suffice for a definite diagnosis and roentgenoscopy in different postures must be resorted to, although even this may lead to a mistaken diagnosis of ulcer or adhesion. Patients with mild symptoms require only medical treatment, but those with severe, relapsing disorders require surgical correction. Fixation to the posterior abdominal wall is one type of operation. Duval recommends posterior duodenopexy with simultaneous antropyloroduodenal attachment by means of a distally mobilized ligamentum teres hepatis. Duodenojejunostomy or gastroenterostomy may counteract stasis but will not correct the malformation. Since none of these methods have given complete satisfaction, Henschen suggested antroduodenal resection with retrocolic, posterior gastroenterostomy. The author employed this operation in the 5 cases.

Treatment of Habitual Shoulder Dislocation with Metal Barrier.—Ramser corrected habitual dislocation of the shoulder in a girl aged 18 by means of Brun's modification of Eden's method. A correctly measured piece of bone from the tibia had been inserted into a pocket on the anterior surface of the neck of the scapula, and immobilization of the arm had been maintained for seven weeks. Two years later the head of the humerus luxated forward repeatedly. A second operation revealed that the transplanted bone was completely absorbed. The author decided to employ nonabsorbable material. He used a clasp of rust free steel. The long peg, measuring 5 cm., was driven in extracapsularly at the edge of the glenoid cavity. It extended 1.5 cm. outward beyond the cavity; the shorter peg, measuring only 2.5 cm., was driven completely into the coracoid process. The middle piece, to which the two pegs stand vertically, measured 4 cm. and was slightly curved. The arm was immobilized for several days in an abduction splint and then gymnastic exercises were begun. Three weeks later the patient was able to assist in hay making. Suturing of the capsule to the short biceps tendon prevents slipping out of the metal clasp. Its deeper penetration is prevented by the coracoid process. In another patient a metal barrier was added to a bone implantation.

Archives de l'Institut Pasteur d'Algérie

21:53-130 (June) 1943. **Partial Index**

*Direct Transmission of Rickettsia Prowazeki to Lungs of Mice from Human Sternal Marrow. E. Benhamou, R. Horrenberger and G. Renoux.—p. 53.
Antimalarial Campaign in Department of Algiers in 1942. E. Collignon.—p. 55.
Report of Functions of Pasteur Institute of Algeria. E. Sergent.—p. 89.

Transmission of Rickettsia Prowazeki to Lung of Mice from Human Sternal Marrow.—Benhamou and his collaborators state that the direct transmission of Rickettsia prowazeki from human sternal marrow to the lung of mice had its point of departure from the observation of one of the authors that Rickettsia prowazeki is encountered regularly in the sternal marrow of patients with exanthematic typhus in quantities sufficient to detect them by direct microscopic examination of slide specimens. From this time sternal marrow was used for the experimental transmission to receptive animals, particularly to those which serve for the production of typhus vaccine. The material which was used for inoculation was obtained from patients with exanthematic typhus in whom the more or less characteristic picture was always confirmed by direct demonstration of Rickettsia prowazeki in the bone marrow slides. The sample obtained by sternal puncture was diluted in a small quantity of isotonic solution of sodium chloride and inoculated into 4 mice by the respiratory route and into 2 rabbits by the intracerebral and peritoneal routes. Subsequent passages from mouse to mouse were made by respiratory inoculation of ground pulmonary tissue and from rabbit to rabbit by intraperitoneal inoculation of ground brain tissue. In one out of five attempts it has been possible to isolate a strain of Rickettsia prowazeki and to adapt it to the lung of mice without passing it through an intermediate host such as rabbit or louse. This proves the high infective power of the bone marrow.

Archivos de Pediatría del Uruguay, Montevideo

14:403-466 (July) 1943. **Partial Index**

*Malignant Lymphogranulomatosis with Compression of Lymph Nodes Causing Serofibrinous Pleurisy and Jaundice in Children. H. J. Notti, H. V. Ferrer and A. Grinfeld.—p. 403.
Bone Changes in Leukemia in Children. J. A. Soto.—p. 415.

Malignant Lymphogranulomatosis in Children.—Notti and his associates report 4 typical cases of malignant lymphogranulomatosis in children between the ages of 3 and 8 years. Stemberg's cells were encountered in the blood of all 4 patients. Two of the patients presented, in addition to the enlargement of the cervical, axillary and mediastinal lymph nodes, enormously enlarged liver and spleen and anemia. Kahn, Pirquet and tuberculin tests were negative and the sputum did not contain tubercle bacilli. One of the patients developed a serofibrinous pleurisy as a result of compression by the mediastinal lymph nodes. Diffuse edema, dyspnea, cough and prostration were the predominant symptoms in the final stage of the disease. The other patient developed acute jaundice. Exploratory laparotomy in this case revealed compression of the hepatic and common bile ducts by enlarged lymph nodes. Roentgen, radium, arsenic and liver therapy failed to arrest the progress of the disease, in these cases which terminated fatally in about two years.

Arquivos de Cir. Clín. e Exper., São Paulo

7:69-104 (April) 1943. **Partial Index**

*Value of Lymph Node Puncture as Diagnostic Procedure. M. Pio da Silva.—p. 69.

Lymph Node Puncture.—Pio da Silva studied 29 cases of lymph node enlargement of various pathologic types. In all cases examination of the dry smear of material obtained by puncture was compared with the microscopic examination of the lymph node. May-Grünwald-Giemsa's method of staining was used in all smears. The lymph node puncture permitted the diagnosis of tuberculosis in 7 out of 12 cases either through the finding of tubercle bacilli or because of the presence of typical epithelioid and giant cells. In each of the 8 cases of blastomycosis smears revealed the presence of Blastomyces. In 4 cases of metastatic carcinoma the presence of numerous neoplastic cells in the punctate permitted a correct diagnosis to be made. In 2 cases of Hodgkin's disease the punctate revealed Reed-Sternberg cells and numerous eosinophils characteristic of the disease.

Gaceta Médica de Mexico, Mexico, D. F.

73:185-332 (June-Aug.) 1943. **Partial Index**

*Simple Atrophy of Optic Disk: A Sign of Subtentorial Tumor. M. Puig Solanes.—p. 199.

Atrophy of Optic Disk in Subtentorial Tumor.—Puig Solanes directs attention to the diagnostic value of simple atrophy of the optic disk in tumors of the fourth ventricle or of the cerebellum. Optic atrophy in these cases is the result of the acute dilatation of the ventricular system. Because ventriculography is contraindicated in certain cases of cerebral tumors, the diagnostic value of simple atrophy of the optic disk is obvious. Simple atrophy of the optic disk in patients with symptoms of intracranial hypertension and other signs of

involvement of cerebral structures in the posterior cranial fossa is pathognomonic of a tumor in these localizations. The diagnostic value of simple atrophy of the optic disk in the foregoing conditions is so reliable that it renders ventriculography unnecessary. The author reports 4 cases in which the diagnosis was verified by removal of the tumor from either the fourth ventricle or the cerebellum.

Prensa Médica Argentina, Buenos Aires

30:1525-1582 (Aug. 18) 1943. **Partial Index**

*Latent Liver Cirrhosis. R. Solé.—p. 1525.
Total Skin Free Graft. E. F. Malbec.—p. 1576.

Latent Liver Cirrhosis.—According to Solé, cirrhosis of the liver is a slowly developing process which in its early stage may produce no clinical symptoms or only atypical syndromes. Clinical and pathologic observations on the latent stage of liver cirrhosis are reported in 12 cases in which exploratory intervention was done because of gastrointestinal hemorrhages of undetermined etiology or because of a diagnosis of biliary stones or abdominal tumors. The only pathologic alteration found at the operation was a more or less severe cirrhosis of the liver diagnosed by biopsy. In all instances the exploratory laparotomy and the later course of the disease ruled out malignant neoplasm and biliary or gastric lesions. Histopathologically the liver proved to be the site of degenerative or inflammatory processes accompanied by connective tissue proliferation around and/or inside the hepatic lobules. Cirrhosis was associated with fatty degeneration of the hepatic cells, more or less extensive foci of necrosis, round cell infiltration, proliferation of vascular endothelium and Kupffer's cells, irregular regeneration of hepatic cells and of biliary canaliculi. Liver damage was always sufficiently extensive to account for a number of clinical syndromes including gastrointestinal hemorrhages; colicky pain with or without jaundice, usually diagnosed as biliary duct stones; anemia, loss of weight, anorexia and asthenia, sometimes with a rather rapid course resembling malignant tumor; and various types of dyspepsia. Cirrhosis of the liver should always be considered in similar instances when the etiologic factors are unknown.

Publicacões Médicas, São Paulo

14:1-64 (May) 1943. **Partial Index**

Main Indications of Roentgenotherapy in Dermatology. J. P. Vieira.—p. 3.
*Sulfathiazole in Treatment of Dysentery and Acute Diarrhea in Children: Observations on 236 Cases. M. Altenfelder, P. P. Corrêa, Maria P. Moreira de Moraes, Alaide Mello Sá and L. Camargo Penteado.—p. 15.

Sulfathiazole for Dysentery and Acute Diarrhea in Children.—Altenfelder and his associates employed sulfathiazole in the treatment of 236 children under 30 months of age with acute diarrhea, bacillary dysentery and amebic dysentery. The drug was administered in doses of 2 grains (0.13 Gm.) every six hours for a period of four days, regardless of the weight or the age of the patient. The drug was effective in all cases in which examination of the stool revealed Escherichia coli, Salmonella, Shigella dysenteriae and Shigella paradysenteriae. Complete recovery occurred within four days in this group. The drug had no beneficial effect on dysentery caused by Lamblia intestinalis and Amoeba dysenteriae. The tolerance to sulfathiazole was remarkable by all children except 1, who vomited and was unable to take the drug. No toxic symptoms were observed.

Revista Argentina de Neurol. y Psiquiat., Rosario

8:245-310 (March-June) 1943. **Partial Index**

*Acute Confusional State Associated with Waterhouse-Friderichsen's Syndrome. H. Hoff and J. A. Shaby.—p. 245.
Subacute Leukoencephalitis. T. Fracassi.—p. 261.

Acute Confusion Associated with Waterhouse-Friderichsen's Syndrome.—Hoff and Shaby report clinical and pathologic observations on 16 patients presenting acute mental confusion associated with features of acute severe infectious disease with high temperature, shock, dehydration and loss of weight. In all cases there was a definite psychic disturbance and change of personality immediately preceding the onset of acute symptoms. The course of the disease was followed in 11 cases. The first 8 cases observed ended fatally in from five to twenty-one days. Postmortem examination revealed slight edema and congestion of the brain, distention of the thyroid follicles and extensive hemorrhages of the adrenal cortex. The clinical and pathologic features were considered by Hoff and Shaby as identical with those observed in the Waterhouse-Friderichsen syndrome associated with a condition of acute mental confusion. Accordingly, treatment with adrenal cortex extract, vitamin C and intravenous injections of metrazol was instituted in the last 4 cases observed. Recovery occurred in 3 of these 4 cases.

Revista de la Asoc. Méd. Argentina, Buenos Aires

57:523-580 (Aug. 15) 1943. **Partial Index**

Neurinoma of Anterior Cervical Region: Case. E. A. Votta.—p. 523.
*Genital Tuberculosis: Relation to Sterility. E. Twaites Lastra and A. Jakob.—p. 536.
Bilateral Tuberculosis of Breast. A. Egües and R. I. Latienda.—p. 554.

Genital Tuberculosis.—Thwaites Lastra and Jakob found tuberculosis of the endometrium in 14 of 1,098 women in whom curettage was performed. Tuberculosis of both fallopian tubes and of the endometrium was encountered in 12 of 840 women operated on for gynecologic disease. Tuberculosis of the internal genitalia lacks pathognomonic clinical signs. Seventy per cent of the patients complained of hemorrhages and of pain in the iliac fossae which increased during menstruation. None of the patients had clinical symptoms or x-ray signs of pulmonary tuberculosis. The authors believe that primary endometrial tuberculosis is more frequent than was formerly believed; it is the cause of sterility in about 7 per cent of the cases. Tubercle bacilli travel by way of the local lymphatic system from the intestine to the parametrium and parametrial and endometrial lymph nodes.

Revista Médica de Chile, Santiago

71:713-828 (Aug.) 1943. **Partial Index**

Goiter and Pregnancy. A. Covarrubias P.—p. 713.
Some Pharmacologic Actions of Urogastrone. E. Montero, F. Huidobro and A. Kuzmanic.—p. 717.
*Cirrhosis of the Liver and Medical Progress. A. Prat Echaurren and R. Jorquera.—p. 755.

Cirrhosis of the Liver.—Echaurren and Jorquera analyzed the data on 36 cases of cirrhosis of the liver followed for a period of one and a half years. According to the presence or absence of clinical signs of liver insufficiency, such as jaundice, hemorrhages, or ascites, the cases were classified in two groups: active and latent cirrhosis. In 80 per cent of 29 cases which were in an active, progressive stage, death occurred within twelve months of the onset of clinical symptoms. The presence or absence of hypertrophy or atrophy of the organ had no relation to the rate of progressiveness of the disease. The majority of the patients with active cirrhosis of the liver presented jaundice, high sedimentation rate, low prothrombin levels, low plasma protein levels, chloride retention especially in the globules, low chloride urinary excretion, oliguria, positive Takata-Ara reaction and low cholesteremia. Oliguria below 500 cc. daily and chloride urinary excretion lower than 2 Gm. per day were regularly associated with a very poor prognosis. In the group with latent liver cirrhosis the sedimentation rate was high as a rule, prothrombin levels were low in 60 per cent, and the Takata-Ara reaction was positive in all cases. Clinical symptoms in this group were scarce and atypical. Latent cirrhosis of the liver should always be considered in patients having pain in the hepatic region, biliary colic, gastrointestinal hemorrhages of undetermined origin, diarrhea, asthenia and history of alcohol addiction. All methods of treatment failed to prevent the progressive course of the active cirrhosis. In 7 out of 10 cases the daily administration of 600 mg. of inositol, combined with a high protein diet, was associated with gain in weight, disappearance of gastrointestinal

symptoms, increase in diuresis and a definite subjective improvement. Echaurren and Jorquera point out that this method of treatment deserves further investigation, particularly in the early stages of cirrhosis of the liver.

Semana Médica, Buenos Aires

50:583-646 (Sept. 9) 1943. **Partial Index**

*Monocytic Angina, Also Called Infectious Mononucleosis. J. Matusevich. —p. 599.
Asthma and Insufficiency of Liver. G. A. Barros.—p. 610.

Monocytic Angina.—This is a frequent infection. The disease appears in epidemic outbreaks. It is more frequent in children and young persons. The diagnosis is made from clinical symptoms from repeated examinations of the blood and from the serologic test. The clinical symptoms are those of any general infection with or without acute tonsillitis, cervical and submaxillary adenitis and fever. Acute tonsillitis is present in the majority of the cases. It is generally unilateral. Local fusospirillar symbiosis is almost constant, but Löffler's bacteria are not found. There may be enlargement of the lymph nodes of the axilla and of the groin and splenomegaly. Adenitis and the acute fever which appear early in the course of the disease may disappear rapidly or persist for weeks or months. Fever declines by lysis and frequently recurs for several short periods. The erythrocytes are normal. The study of white cells is indispensable for a diagnosis. There is a leukocytosis between 10,000 and 40,000 and a high mononucleosis with predominance of monocytes and lymphocytes. A positive Davidsohn serologic test is specific for the disease. Administration of calcium and liver preparations and of vitamins shortens the course of the disease and renders the symptoms milder.

Archiv für Kinderheilkunde, Stuttgart

126:1-64 (May 29) 1942

Intussusceptum Evacuated in Natural Way. F. Szlávik.—p. 2.
Endemic Appearance of Hepatic Cirrhosis in Early Childhood. F. Schuler.—p. 5.
Problem of Immunization in Scarlet Fever. Z. Teveli.—p. 30.
*Atypical Forms of Poliomyelitis. E. Strangmann.—p. 38.
Acute Atrophy of Liver During Childhood. E. Gasser.—p. 49.

Atypical Forms of Poliomyelitis.—Strangmann shows that in addition to the classic spinal form of poliomyelitis there exist nonparalytic, meningitic, cerebral and cerebellar types. He describes atypical cases of poliomyelitis observed by him during the summer and fall of 1941. The nonparalytic meningitic forms were particularly numerous. There were also cerebral forms and encephalitis-like disturbances with rapidly changing mental symptoms. These types are of particular significance for the early diagnosis of poliomyelitis. During epidemics it is essential to pay attention to all the known prodromal symptoms and to perform spinal punctures whenever meningitic symptoms are present. While nonparalytic cases of poliomyelitis furnish valuable convalescent serum, the fact that some of these cases are incorrectly diagnosed reduces the value of such serum.

Deutsche medizinische Wochenschrift, Leipzig

68:649-672 (June 26) 1942. **Partial Index**

*Carcinoma of Stomach and Gastritis: Evaluation of So-Called Anamnesis of Carcinoma. H. Westhues.—p. 649.
Clinical Value of Demonstration of Tubercle Bacilli in Feces of Patients with Tuberculosis of Lungs. J. E. Wolf.—p. 653.
Congenital Anomalies of Brain. A. Czerny.—p. 658.
Whole Grain Flower in Formula of Babies and in Diet of Infants. H. Gronau.—p. 660.
Objections Against Diet Opposed to Carcinoma. M. Weiser.—p. 663.

Carcinoma of Stomach and Gastritis.—Westhues considers three types of clinical courses of gastric carcinoma. The first type is represented by cases with a long, severe course caused by a chronic, severe gastritis. Chronic gastritis is different from atrophic gastritis. Carcinoma may have developed from gastritis in some of the cases, but causal relationship between carcinoma and severe chronic gastritis may be absent in other cases, while the gastritis may be secondary, caused by primary blastomatous polypi in still other cases. This group is small. A long history usually divided into two phases will be found in the second group. The first phase may sometimes be traced for many years. This, so-called "preanamnesis," is characterized by mild clinical disturbances ("weak stomach"). Thus a mild type of chronic gastritis may be the pathologic-anatomic basis from which, however, carcinoma will not develop, or there may be gastritis of old age or even a gastrosis, which does not depend on inflammation. It may be a predisposing "specific" condition of mucous membrane from which carcinoma may result. In the first instance the preanamnesis is not related to the later occurrence of carcinoma; in the second type one deals with a true preanamnesis of carcinoma as related to gastritis of old age or to gastrosis. The preceding history therefore is not of practical importance when one considers the frequency of mild common gastritis. The second and short phase refers to the true severe carcinoma—gastritis associated with a more or less acute onset during the last few months. It is an acute gastritis caused by a carcinoma developing on a basis of an existent chronic gastritis-gastrosis. The true carcinoma-gastritis thus always presents a chronic atrophic gastritis associated with an acute onset. This gastritis is associated with acute exacerbation and cannot be the cause of the carcinoma. The long mild anamnesis with two phases does not support the concept that inflammation is of essential importance in the genesis of carcinoma. The classic short anamnesis is found in the third group. From the pathologic-anatomic point of view one deals with the same chronic atrophic gastritis on which the principal history of the previous group has been based, but clinical symptoms have not resulted from the gastritis of old age. The severe gastritis to which the short anamnesis refers is secondary and is thus not responsible for the carcinoma. The time factor in these cases is also opposed to the inflammatory genesis of carcinoma. Gastritis may play, however, a certain incentive role although carcinoma is not of inflammatory origin in the majority of the cases. The treatment of gastritis (particularly resection for gastritis) may play some part in the prophylaxis of carcinoma. But incidence of carcinoma will not be decisively reduced by this type of treatment. Early treatment of carcinoma based on early diagnosis is the main prophylaxis of carcinoma. The long history calls for a particularly careful clinical examination and continued control of the individual case.

Medizinische Klinik, Berlin

38:529-552 (June 5) 1942. **Partial Index**

Sensitizing and Protective Substances Against Action of Light Rays on Skin. G. Hopf.—p. 529.
*Lambliasis Intestinalis in Poland. E. F. Rissmann.—p. 532.
Roentgenologic Examinations of Kidneys. L. Stehr.—p. 534.
Bactericidal Action of Synthobilin, a Choleretic Substance. B. Kemkes. —p. 540.

Lambliasis Intestinalis.—At Rissmann's hospital in Krakow it was the rule to perform duodenal aspiration on all patients with gastrointestinal disturbances and it was found that lambliasis was about as frequent as bacillary dysentery. Twenty-six cases of lambliasis were observed during the same period in which 25 cases of bacillary dysentery occurred. The largest number of cases occurred when lettuce and radishes appeared on the market in larger quantities, that is during the months from June to October. Rissmann rejects the idea that Lamblia intestinalis is a harmless parasite. An alkaline milieu greatly favors its development. The lamblias flourish in the duodenum particularly when gastric aspiration reveals anacid or subacid values. Eight of the author's patients had no free hydrochloric acid, 12 had subacid values, 5 had normal acidity and only 1 had hyperacidity. There are 3 types of lambliasis: the gastrointestinal, the cholangitic-hepatic and the cachectic form. One type develops chronologically from another if the disease is not detected and treated during the early stages. Acridine dye derivatives such as atabrine and acranil are most effective in the treatment. The therapeutic success should be controlled by duodenal aspiration. All hygienic measures against intestinal infections are directed also against lambliasis. Duodenal aspiration should be done in every persistent epigas-

tric disorder, particularly in loss of weight and jaundice. The duodenal juice must be examined, since lamblias do not remain viable for long. Early treatment will prevent parenchymal lesions of the liver.

Münchener medizinische Wochenschrift, Munich

89:461-482 (May 22) 1942. **Partial Index**

Treatment of Neuralgia of Glossopharyngeal and Major Occipital Nerves. M. Kirschner.—p. 461.
*Pathologic Anatomy of Epidemic Hepatitis. H. Siegmund.—p. 463.
Treatment of Melena Neonatorum. W. Wolf.—p. 469.
Treatment of Puerperal Infections with Tibatin, a Sulfonamide. L. Ostendorf.—p. 472.

Pathologic Anatomy of Epidemic Hepatitis.—Because epidemic hepatitis ordinarily terminates in recovery, little is known about its pathologic anatomy. Siegmund had an opportunity to make studies post mortem in 3 cases in which death occurred either of wounds or of disease other than the jaundice. Their epidemic hepatitis ran the typical benign course. He also made studies post mortem in cases in which death resulted from hepatic coma, although the disorder had at first pursued the usual benign course. Hepatic damage was present in all 5 cases. The liver cells in the central portion of the lobule about the central vein showed degenerative changes. The individual cells were smaller, their nucleus was pyknotic and the protoplasm was acidophilic. There was fatty degeneration, accumulation of bile and cell necrosis. The connection between the lobules and the septal framework was less intimate than normally, so that the hepatic cells seemed isolated in wide clefts. Extensive changes were noticeable also in the veins and capillary walls. The hepatic changes in the 2 cases in which death resulted from hepatic coma were similar, but more serious than in the other 3 cases. The pathologic alterations do not reveal whether the condition is caused by infection or intoxication. The appearance of the disease in groups and the fever seem to suggest a living pathogenic agent. The author was particularly impressed by the miliary necroses in the striated skeletal muscles of patients with epidemic hepatitis, that is, by changes which in Weil's disease (spirochetosis icterohemorrhagica) are apparently brought on by the leptospira. This observation and the fact that the jaundice appeared particularly in soldiers who were constructing bridges or doing other work in water suggests a possible etiologic role of water spirochetes.

89:483-506 (May 29) 1942. **Partial Index**

Campaign Against Typhus in General Government of Poland. R. Wohlrab.—p. 483.
Evaluation of Atony of Bladder in Wartime. W. Borgard.—p. 488.
Value of Culture Method in Recovery Test of Gonorrhea in Women Treated with Sulfonamides. C. Moncorps and A. Herfeld.—p. 490.
*Poisoning Caused by Hydrocyanic Acid Absorption Through Skin. B. Müller-Hess.—p. 492.
Diagnosis of Typhus and Scarlet Fever Based on Early Symptoms. H. Rehder.—p. 495.
Rare Complications in Measles. K. Oxenius.—p. 495.
Special Eating Utensils to Faciliate Meals in Case of Failure of Buccinator and Orbicularis Due to Paralysis of Facial Nerve. B. Friton.—p. 496.

Poisoning Caused by Hydrocyanic Acid Absorption Through Skin.—Müller-Hess states that absorption of hydrocyanic acid compounds through the healthy skin causes severe toxic symptoms in man and animals. Flury's experiment on himself and Flury and Walther's animal experiments in which typical symptoms of poisoning were produced although inhalation of hydrocyanic acid was prevented by special gas masks are quoted to prove this contention. Attention is called to the hazard to which workmen may be exposed in close workrooms during continued occupation with cyanic acid containing material, although the content may not exceed 2 per cent. Two cases are reported to demonstrate that such poisoning may occur even much easier through the skin which had been previously injured. Fifty Gm. of a 10 per cent cyanic acid solution was applied by mistake to an extensive pyoderma of the scalp in an infant 14 months of age. An 80 per cent, hot substance of sodium cyanide splashed on the head and shoulders of a workman, causing superficial lesions. In both cases typical symptoms of cyanic acid poisoning developed within five minutes. Treatment consists in administration of cardiac and respiratory stimulants. Artificial respiration and administration of lobeline may prevent paralysis of respiration. Slow intravenous administration of 1 per cent methylene blue (from 10 to 40 cc.) or of 50 per cent sodium thiosulfate solution (0.5 Gm. for 1 Kg. of body weight, i. e. 70 cc. for an adult person of 70 Kg.) is recommended.

Zeitschrift für Immunitätsforschung, Jena

101:161-224 (March 16) 1942

Sympathetic Nervous System and Immunity. S. Went.—p. 161.
Action of Heparin and Other Substances that Inhibit Blood Coagulation in Production of Immunobiologic Defense Reaction in Bacterial Diseases—Third Report: Heparin and Course of Infection. Phagocytosis Experiments with Heparin. J. F. Magerl.—p. 168.
Recent Studies on Action of Vaccine Which Contains Precipitate. F. Faragó and K. Ujhelyi.—p. 178.
Determination of Numbers of Bacteria with Photometer. R. Haas and H. Sallermann.—p. 183.
*Vaccination Against Typhoid by Single Injection of New Precipitated Vaccine. I. Lovrekovich and K. Rauss.—p. 194.
*Comparative Studies on Immunizing Value of Precipitated Extract of Typhoid Bacilli Suspension and of Typhoid Vaccine. K. Rauss.—p. 211.

Single Injection of Precipitated Typhoid Vaccine.—Lovrekovich and Rauss, by slightly changing the method of Grasset, produced from suspensions of living typhoid bacilli an extract which contained the antigens H, O and Vi. The extract is slightly toxic for mice and cannot be detoxicated by solution of formaldehyde, because this inactivates the Vi antigen. By injecting the extract into rabbits, one can obtained a serum with high agglutinating power. A single dose of from 0.005 to 0.02 cc. of this extract immunizes mice against a fatal dose of the typhoid 2 strain. The antigens of the extract are absorbed with slight loss by an aluminum hydroxide precipitate that develops at a p_H of from 6.2 to 6.4 in the presence of 2.5 per cent alum. The serums of rabbits treated once subcutaneously with the precipitated vaccine contain high concentrations of the H and O agglutinins. Comparative tests on groups of mice treated either once with precipitated vaccine or the extract or three times with ordinary typhoid vaccine revealed that animals that were treated with the precipitate have the strongest immunity. The passive immunization capacity of the blood serum of rabbits immunized by one treatment with precipitated vaccine, when tested on mice, proves stronger than that obtained after three treatments with the ordinary vaccine. In human subjects a single vaccination with the precipitated vaccine produces considerable amounts of H, O and Vi agglutinins and as strong an immunity as does triple vaccination with ordinary typhoid vaccine.

Comparative Immunizing Value of Precipitated Typhoid Bacillus Extract and of Vaccine.—In order to test the immunizing value of the precipitated typhoid bacilli extract, 12,813 persons were treated once with this substance. At the same time 10,962 persons were treated three times with typhoid vaccine and 10,059 persons served as controls. The local and general reactions that follow the administration of the precipitated substance are more severe than those which follow one dose of ordinary vaccine. The reaction subsides at the latest after twelve hours. The agglutinin titer of the serum was determined in 306 persons treated with the precipitate and in 58 treated with the ordinary vaccine. It was found that the precipitated substance produces more H and O agglutinins than does typhoid vaccine; moreover, the titer decreases more slowly after the precipitate. The precipitated substance also forms Vi agglutinin. Comparing the incidence of typhoid infections after the two methods of immunization, it was found that the immunity which is induced by a single administration of precipitate is just as reliable as that which is produced by three administrations of vaccine. The observation of the immunized persons extended from the twelfth to the thirty-sixth month and revealed that the immunity induced by the precipitate is just as lasting as that after triple vaccination. Further observations are necessary to decide whether typhoid vaccine can be replaced by the precipitated substance.

Book Notices

History of Surgery. By Richard A. Leonardo, M.D., Ch.M., F.I.C.S. Cloth. Price, $7.50. Pp. 504, with 100 plates. New York: Froben Press, 1943.

The appearance of the first history of surgery in English will be welcomed by members of the medical profession. The volume contains 370 pages of text, 56 pages of bibliography, 23 pages of index and 100 plates of illustrations grouped together as a sort of appendix to the text. To condense the subject matter at hand into 376 pages calls for skill in condensation, selection and balance rarely possessed by the casual writer. In appraising this difficult task the reviewer is quite conscious of the difficulties which confronted the author. The chapters dealing with the practices of the ancient peoples contain much that is interesting and instructive. The subsequent chapters show some of the disadvantages of trying to tell much in short space. There appear some avoidable errors, minor inaccuracies, errors in overemphasis as well as in understatement and errors of omission and of judgment. Most of these are not of great importance and do not impair the value of the work. Attention is called to them merely because the reviewer feels that the function of "a history" is to eliminate errors rather than to perpetuate them.

Military surgery is dealt with in three pages and does not contain the names of Larrey, Pirogov or von Bergmann. In the chapter on thoracic surgery the subject of pulmonary embolectomy is dismissed by stating that Kirschner performed the first successful pulmonary embolectomy in 1924. The fact that Trendelenburg in 1908 conceived the operation and developed its technic on cadavers is not mentioned, nor is it stated that following a number of unsuccessful attempts after the Kirschner operation A. W. Meyer performed several successful pulmonary embolectomies (*Surg., Gynec. & Obst.* **50**:891 [May] 1930). To dismiss the subject of ethylene anesthesia with a single line (p. 339), "Ethylene anesthesia in genitourinary surgery was used by Kretschmer (1911)," does not make sense. It does injustice to the physiologist Arno Luckhardt, who discovered the anesthetic properties of the gas, and credits Kretschmer with something to which he never laid claim. Kraske was born, educated, trained and worked all his life in Germany. To place him in Switzerland is an error that could have been avoided by consulting the reliable Fischer. Speaking of Bassimi, the author states "Well known also is Bassini's operation for inguinal hernia—an operation done in hundreds of cases daily." Bassini is remembered today only because of his classic herniotomy; whatever other contributions he has made are of no historical importance. This is an example of an error in emphasis.

Finsterer is accorded more than a page, while von Eiselsberg receives five lines. Von Eiselsberg was, of course, a greater surgeon and did far more to advance surgery than Finsterer. The author appears to be much impressed by the number of gastrectomies performed by Finsterer. If that is his criterion, then the palm should go to von Haberer, who, by the way, is mentioned only in passing. As a matter of fact, Finsterer's claim to either originality or priority in the operation for subtotal gastrectomy with an end to side anastomosis is not well founded. This operation was first conceived by von Hacker in 1885 and was first performed by Krönlein. It was elaborated by von Eiselsberg, Roux, von Mikulicz, Delagénière, Doyen and others. In its present form, to which it was brought by Hofmeister, it has been given further application by a great number of surgeons, such as Reichel, Sasse, Polya, the Mayos and Moynihan. The report of 56 cases in which Hofmeister operated can be found in a contribution by W. Burk, one of his assistants (*Beitr. z. klin. Chir.* **76**:638, 1911). Finsterer in 1913 advocated a very radical resection of the stomach for the cure of ulcer on the ground that the acidity is reduced thereby, an idea to which we today do not wholeheartedly subscribe. However, the method described by him does not differ in any detail from that of Reichel or of Hofmeister (see "Gastric Resection and Various Methods of Reestablishing the Continuity of the Gastrointestinal Tract," *International Abstract of Surgery*, Collective Review, February 1926). It would be only fair to call attention to the fact that Emil Rees of Chicago developed independently of and prior to Wertheim the same operation for carcinoma of the cervix uteri with which Wertheim is correctly credited.

In the chapter on American surgery the author includes men whose sole claim to immortality appears to be membership in certain associations or being a secretary or an editor of a surgical publication. It is not argued that these men are not competent surgeons. Competence alone, however, and mastery of ideas and technics developed by others do not entitle one to be mentioned among the makers of surgical history. Only men who have advanced the frontiers of our knowledge in this field are entitled to that unique honor. This is error in judgment as well as bad taste. One begins to wonder whether the author is writing a history or compiling a directory. The name of L. L. McArthur should have been mentioned among the pioneers in the field of appendicitis. Halstead introduced rubber gloves in his operating room not primarily to improve asepsis but because his head surgical nurse could not tolerate powerful antiseptics on her hands. While it is true that Nicholas Senn bequeathed his collection of books to the Newberry Library (p. 315) it is worth noting that the Newberry Library turned the gift over to the John Crerar Library, where the gift is lodged in the Nicholas Senn Room. The service this library is rendering the profession deserves mention.

Finally, it is felt that the illustrations would serve their purpose much better if they accompanied the text rather than being grouped together at the end of the book as a sort of separate chapter.

Family Nutrition. Published by the Philadelphia Child Health Society. Second edition. Paper. Price, 50 cents. Pp. 119, with illustrations. Philadelphia, 1943.

This monograph on family nutrition is a complete treatise. Much of the material is closely set in long lines of relatively small type, which does not make for easy reading. For the student of nutrition, the teacher or the demonstrator, this manual should be exceptionally valuable. It is on too high a scientific level for the vast majority of housewives. Yet it contains much material of great value to precisely this group. The chapter on the dietary value of common foods, and especially the illustrative pages facing the text, is not only informative but is the most readable part of the entire booklet. An excellent feature is the full page bleed-off illustrations and many of the diagrams. Another valuable feature is that beginning on page 70, which shows a week of good meals for children, for boys and girls, for adolescents, for expectant mothers and for various family income groups. As a reference manual for persons capable of using such a device, this publication could be of extreme usefulness in the upper third of homes, where, unfortunately, it is needed least. In fact, to the vast group of nonprofessional persons who make up what is vaguely referred to as "the public" this excellent production would unfortunately remain unappreciated.

The Education of Nurses: Historical Foundations and Modern Trends. By Isabel Maitland Stewart, R.N., A.M., Professor of Nursing Education and Director of the Division of Nursing Education, Teachers College, Columbia University, New York. Cloth. Price, $3.50. Pp. 399. New York: Macmillan Company, 1943.

Primarily designed for students and educators in nursing, this book presents the progress of nursing education from its ancient origins to the problems it faces in the postwar world. Parallels to the progress and problems of medical education are close: informal instruction preceded the organization of schools, which flourished in numbers if not in quality. There was concern over a supply of graduates, many of them poorly trained, in excess of demands for their services, followed by a decrease in numbers through enforcement of elevated educational standards and improved instruction. The war and its unpredicted casualties then created a shortage, requiring a wisely adjusted balance between unwarranted increases in graduates to serve the new demands and a preservation of such educational standards as would insure adequate care of the sick and injured in wartime and after the peace. The book is written with an imagination that relates the events of the dead past to the living problems of today and tomorrow.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

MENTAL IMPAIRMENT IN EPILEPSY

To the Editor:—Most of the textbooks teach that epilepsy has much effect on the mind or mental faculties. I seem to recall that some good authority said that the present teaching was that epilepsy seldom affected the mind. Are you able to give me any information on this subject, especially as it affects childhood epilepsy? Ludwig L. Sogge, M.D., Windom, Minn.

ANSWER.—Approximately one third of epileptic patients seen outside of institutions show some degree of mental impairment, though in only about 10 per cent is this so gross as to be immediately evident. Mental deterioration, when it occurs, is not necessarily the result of the epilepsy. It may be genetic or the result of an antecedent brain injury, of oversedation or of social and intellectual isolation. Various factors may be at work in a given person. The younger the patient when epilepsy begins the graver the prognosis. However, as with adults, various conditions greatly modify the individual outlook. The prognosis is improved if the child had a negative family history of epilepsy or mental disorder, was mentally normal at birth, has no evidence of brain disease, has petit mal (pyknoepilepsy) or infrequent grand mal and receives proper drug and psychologic treatment. Bibliographies and statistical data on this subject may be found in the following books:

Penfield, Wilder, and Erickson, T. C.: Epilepsy and Cerebral Localization, Springfield, Ill., Charles C Thomas, 1942.

Lennox, W. G.: Science and Seizures, New York, Harper & Brothers, 1941.

METHYL TESTOSTERONE FOR MYASTHENIA GRAVIS

To the Editor:—Do you have any information on the use of testosterone preparations in the treatment of myasthenia gravis? I have been told that methyl testosterone has been used in this disease because of its effect on creatine and creatinine metabolism. M.D., Illinois.

ANSWER.—Methyl testosterone has been used in the treatment of myasthenia gravis. Reports on this therapy have not appeared in the literature so far as is known. One clinic has used the drug in the following manner: Fifty mg. has been given each day for a period of two weeks. If no response occurred at that time in the symptoms of myasthenia gravis, the drug was discontinued. At the end of two weeks, if response had taken place, the amount was reduced to 30 mg. a day for a period of four weeks. This was followed by a period of two weeks with a dose of 20 mg. a day. The drug was always taken by mouth. The dosage schedule, as indicated, was set up in an entirely arbitrary manner, there being no way to estimate the amount needed in myasthenia gravis.

One patient, a physician, made a careful observation of his own reactions to this drug. He was well adjusted to prostigmine bromide and therefore was in a position to judge the effect of the addition of methyl testosterone. He was careful, moreover, to control adequately the period of observation, making no change in his way of life. He reports that, after the first forty-eight hours of taking the drug, slow, steady improvement began, which was continued during the subsequent six months. The first effect of the methyl testosterone was a violent peristalsis, indicating that the patient was receiving an overdose of prostigmine bromide. The patient was able to reduce the prostigmine dosage from ten to twelve 15 mg. tablets a day, his maintenance schedule, to about five tablets a day. At the same time he experienced a sense of well-being. When the methyl testosterone was discontinued after a month's trial, he had the most severe exacerbation of his symptoms of myasthenia gravis that he had ever experienced. When methyl testosterone was again given at the end of six weeks, another remission in the myasthenia gravis occurred. In this single case, therefore, the report would indicate that methyl testosterone, when given to patients with myasthenia gravis, tends to cause a remission which lasts as long as the methyl testosterone is taken. One should not conclude, however, that the experiences of this trained observer necessarily mean that similar results would be experienced in other cases. In 4 other cases, moreover, when the drug was used, 1 responded in a similar manner, but in 3 others good effects were not observed.

OVULATION AND PREGNANCY

To the Editor:—When a woman becomes pregnant, does ovulation cease for the duration of the pregnancy? I am teaching a class of nurses and was asked this question. My answer was that I thought ovulation ceased, but I was not positive. I had trouble finding a satisfactory answer in books so am writing you. Further, is it through endocrine action that it ceases, if it does? M.D., Wisconsin.

ANSWER.—Ovulation probably ceases in women during pregnancy. The main evidence is that: 1. Ovaries removed at operation from pregnant women show no recent corpora lutea nor other evidence that ovulation takes place. It is believed that maturation of the ovum may occur but that this terminates in degenerative changes and atresia. 2. If ovulation did occur in human pregnancy one would think that the ovum so produced would not infrequently become fertilized during the first three months of gestation, when the uterine cavity has not yet become obliterated by the fusion of the decidua vera and decidua reflexa. Under such circumstances it would seem quite possible for the ovum to descend the fallopian tube and embed itself in the decidua vera, thereby giving rise to a second, younger pregnancy, or superfetation. Actually, proved cases of superfetation in the human being are not on record (Studdiford, W. E.: *Am. J. Obst. & Gynec.* **31**:845 [May] 1936). 3. In the rabbit a definite physiologic inhibition of ovulation exists during pregnancy. Thus, Snyder and Wislocki (*Bull. Johns Hopkins Hosp.* **49**:106 [Aug.] 1931) have found that in the pregnant rabbit the amount of pregnancy urine required to produce ovulation is twenty to forty times that needed in the nonpregnant animal.

This presumable cessation of ovulation during pregnancy is almost certainly endocrine in nature. Two explanations have been advanced: the inhibitory effect of progesterone on ovulation and the action of chorionic gonadotropin, probably through the pituitary, in suppressing ovarian function.

MASKING AND CONTAGION

To the Editor:—"The value of wearing masks in contagion, . . . particularly with reference to epidemic meningitis, tuberculosis, diphtheria and virus pneumonia" (The Journal, Oct. 16, 1943, p. 448), merits comment.

Operating room technic demands masking of the nose and mouth because this has proved to reduce sharply the infection of the wound, blocking most of the point blank showering of fresh droplet borne pathogens of healthy carriers from access to relatively unresisting tissues of patients. Contagious precaution technic for diphtheria and virus pneumonia similarly demands masking of all personnel and visitors. It applies also to scarlet fever, measles, influenza, infectious mononucleosis and all such diseases as notably lower resistance, since superinfections complicating them often arise not from the patient's own microflora but from contact carriers' new invasive pathogens. Groups of rheumatic fever convalescents deserve such precautions, and infants should always be so shielded from the common colds of the household. Indeed, the operating room is but one of the places where susceptible exposed tissues are efficiently safeguarded by masking.

Bactericidal aerosol sprays and ultraviolet barriers can be nullified momentarily by the vagaries of air currents, so that they are not to be depended on to protect against the transfer of fresh pathogens as described, or even against all the air contaminants persisting after dispersal and settling or drying of vector droplets. Fine on paper, in practice they stand with sulfonamide prophylaxis in requiring constant toxicologic and bacteriologic checking. They in no way replace the need of masking, which acts right at the source to prevent significant massive inoculums from ever reaching the air, i. e. by air asepsis.

Of course it is never the mask wearer who is being protected. All agree that dried aerial microflora is poorly filtered by any tolerable mask yet devised. Protection for the wearer would have to resemble a gas mask to prevent heavy seeding of the nose and throat of air bacteria transported in tears through the nasolacrimal ducts. Unthinking writers have repeatedly misinterpreted these facts to condemn all masking: they do not realize at all what the proper role of the mask is.

Dangerous respiratory contagions always demand masking during physical examinations and during bedside care, for sick people even when themselves physicians rarely remain so well mannered as not to cough or speak into others' faces. Here the patient must temporarily don the mask, since it works only against the egress of pathogens. Patients having open tuberculosis are unfortunately seldom masked even in teaching institutions. Since most entering students of medicine and nursing are nowadays tuberculin negative and ought to be kept so, such masking as the first step must be enforced to improve the record of occupational tuberculosis morbidity.

Tuberculous patients also benefit by instruction. While they do not learn from usual precepts and pamphlets to lessen gross contamination of air and objects in their surroundings, they do learn readily after they have seen for themselves the insidious spreadings of their own sputum. It is for the physician to dust onto the pharynx a few milligrams of powdered medicinal methylene blue with a clean dried camel's hair brush. A few such applications suffice to teach even an obtuse patient the habits that efficiently keep sputum from reaching most of his close environs (by way of toothbrush, fingers and so on) and that lessen significantly the contamination of air by close range speaking and by open mouthed and unmuffled sneezing or coughing.

Let no one suppose that buying bactericidal gadgets solves the problem, and particularly let no one condemn the aseptic role of masks.

Robert J. Kinney, M.D., Boston.